Technical Study 35

FEDERAL INVOLVEMENT IN POST-SECONDARY EDUCATION FOR HIGHLY QUALIFIED LABOUR

(Parts I and II)

David Stager

July 1981

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ABSTRACT

FEDERAL INVOLVMENT IN POST-SECONDARY EDUCATION FOR HIGHLY QUALIFIED LABOUR

David Stager

Part One

This part of the report is comprised of three chapters that (1) define the nature and magnitude of highly qualified labour and the rationale for federal involvement in its development; (2) outline the evolution of federal involvement; and (3) detail the current federal role in terms of fiscal transfers, student loans, graduate fellowships and other programs.

The rationale for federal government involvement in the development of HQL includes its concern for interpersonal and interprovincial income distribution and employment opportunity, for reduction of unemployment and wage inflation due to labour market imbalances and imperfections and for the social benefits associated with research and development.

There is a long history of federal support for institutional training, from the founding of the Royal Military College in 1884 to grants for agricultural instruction (1913-1923) and technical education (1919-1938).

The 1913 report of a federal Royal Commission on technical education recommended a major federal-provincial program for technical training, and in 1919 a 10-year program was introduced and extended twice to 1939. A Youth Training Act of 1939 and the Vocational Training Co-ordination Act of 1942 led to the Technical and Vocational Training Assistance Act (TVTA) of 1960, which provided for federal-provincial, shared-cost programs that established the current secondary and post-secondary vocational training system. Federal support for universities evolved from the Veterans

Rehabilitation Act (1942-1951), to the per capita grants program for direct federal aid (1951-1966), to the shared-cost fiscal arrangements of 1967-1976. A small federal-provincial student aid program existed from 1939 to 1964 when it was replaced by the Canada Student Loans Plan, the base for current provincial student assistance plans.

In 1977, the federal government retreated from post-secondary education by transferring tax points to the provinces, together with cash adjustment payments, neither of which were conditional on provincial operating expenditures for post-secondary education. In some provinces, the total operating expenditure for post-secondary education is only slightly greater than the value of the federal cash transfers.

The federal government also contributes to post-secondary education through graduate fellowships administered by three granting agencies (NSERC, MRC, and SSHRC), tax expenditures based on deductible tuition fees and other items, military and public service training and bilingual instruction.

Part Two

The second part of the report evaluates current programs for HQL development and discusses alternative approaches.

Cost-benefit analysis is used to evaluate resource allocation in post-secondary education, although certain limitations of this technique are acknowledged. It appears that the rates of return to total investment in post-secondary education increased dramatically in the 1960s and then declined just as sharply in the 1970s as demand for HQL first out-paced supply and then was overtaken by supply.

Various interpretations have been offered for this phenomenon, but it is generally agreed that the recent decline is part of a fairly short cycle rather than part of a longer trend.

Several studies show that the net returns are highest in professional fields such as dentistry, medicine, law, engineering and commerce, and for graduates of non-university technology programs. These differences -- even after adjustments for market imperfections -- suggest that modest shifts in resource allocation towards health, business and technology would be warranted.

The fundamental hurdle in designing a national scheme for the development of HQL is the federal-provincial polarity on matters relating to education and training. The federal policy for Established Programs Financing has no guiding effect on HQL development because the provinces treat the fiscal transfers as unconditional revenue. The federal government should re-establish both a shared-cost and direct-grants program for specified fields of study. There also should be a Canadian Commission on Professional and Technical Manpower, comprised of federal, provincial and other persons, for research, planning and granting in the manpower area.

Student financial assistance should be provided through a contingent repayment loan program with repayments, based on the graduate's income, made through the income tax system. The federal government should also introduce its own bursary program to equalize student assistance across provinces and to establish greater differentials among tuition fees for different levels and fields of study and to encourage prompter adjustments to labour market imbalances.

Satisfactory development of HQL also requires better information for policy evaluation and development and for individuals' career planning. This would involve the federal government in expanded programs for data collection and analysis, information dissemination and employment opportunities for students.

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RÔLE DU GOUVERNEMENT FÉDÉRAL DANS LA CONSTITUTION D'UNE MAIN-D'OEUVRE HAUTEMENT QUALIFIÉE

David Stager

Première partie

Cette partie de l'étude comprend trois chapitres qui définissent 1) la nature et la taille de la main-d'oeuvre hautement qualifiée et les raisons fondamentales de la participation fédérale à sa constitution; 2) l'évolution de la participation fédérale; et 3) le rôle actuel du fédéral à cet égard (virements fiscaux, prêts aux étudiants, bourses d'études supérieures et autres programmes).

La justification de la participation du gouvernement fédéral à la constitution d'une main-d'oeuvre hautement qualifiée repose sur son souci d'équilibrer la répartition des revenus et les possibilités d'emploi entre les particuliers et entre les provinces, de réduire le taux de chômage et la hausse des salaires imputables aux déséquilibres et imperfections du marché du travail, ainsi que de favoriser les avantages sociaux liés à la recherche et au développement.

Il y a longtemps que le gouvernement fédéral appuie la formation en établissement: entre autres, le Royal Military College a été fondé en 1884 et des subventions ont été accordées au titre de l'enseignement agricole (1913-1923) et des études techniques (1919-1938).

Le rapport de la Commission royale d'enquête fédérale sur l'instruction technique, déposé en 1913, proposait la création d'un programme fédéral-provincial d'envergure en matière de formation technique. En 1919, un programme décennal a été adopté et prolongé jusqu'en 1939. La Loi sur la formation de la jeunesse de 1939 et la Loi sur la coordination de la formation professionnelle de 1942 ont

mené à l'adoption, en 1960, de la Loi sur l'assistance à la formation technique et professionnelle (LAFTP), aux termes de laquelle ont été créés les programmes fédéraux-provinciaux à frais partagés, dont découle le système actuel de formation professionnelle secondaire et postsecondaire. L'aide fédérale consentie aux universités remonte à la Loi sur la réadaptation des anciens combattants (1942-1951). On a institué par la suite un programme de subventions par habitant, prévoyant une aide fédérale directe aux universités (1951-1966); et, enfin, des programmes fédéraux-provinciaux de partage des coûts ont été adoptés entre 1967 et 1976. Un modeste programme fédéral-provincial d'aide aux étudiants a existé entre 1939 et 1964, date à laquelle il a été remplacé par le Régime canadien de prêts aux étudiants, sur lequel repose actuellement les programmes de prêts aux étudiants des diverses provinces.

En 1977, le gouvernement fédéral s'est retiré du domaine de l'enseignement postsecondaire en virant des points fiscaux aux provinces et en leur versant des sommes pour les aider à faire la transition. Ni l'une ni l'autre de ces concessions n'a été faite en fonction des frais d'exploitation des provinces en matière d'enseignement postsecondaire. Dans certaines provinces, ces dépenses sont à peine plus élevées que les virements de recettes fédérales.

Le gouvernement fédéral contribue également à l'enseignement postsecondaire au moyen de bourses d'études supérieures administrées par trois organismes habilités à octroyer des subventions (CRSNG, CRM et CRSHC), de dépenses fiscales (frais de scolarité déductibles et autres), de la formation de militaires et de fonctionnaires ainsi que par l'entremise de programmes d'enseignement des langues officielles.

Seconde partie

La seconde partie de l'étude fait le point sur les programmes actuels visant la constitution d'une main-d'oeuvre hautement qualifiée et examine des solutions de rechange.

On procède à une analyse avantages-coûts pour évaluer la répartition des ressources en matière d'enseignement postsecondaire, tout en reconnaissant les limites de cette technique. Il semble que le rendement par rapport à l'investissement global dans l'enseignement postsecondaire ait augmenté de façon vertigineuse dans les années 1960 pour ensuite s'affaisser tout aussi rapidement dans les années 1970, alors que l'offre dépassait la demande de main-d'oeuvre qualifiée après lui avoir été inférieure. C'est un phénomène qui s'explique de bien des façons, mais il est généralement admis que la récente baisse fait partie d'un cycle d'assez courte durée plutôt que d'une tendance à long terme.

Plusieurs études montrent que le rendement net est plus élevé dans les professions comme l'art dentaire, la médecine, le droit, le génie et le commerce, ainsi que dans les programmes offerts par les écoles techniques. Ces différences de rendement laissent croire, même si l'on tient compte des imperfections du marché du travail, qu'une modeste réorientation de la répartition des ressources vers la santé, les affaires et la technologie est indiquée.

Les différends entre le gouvernement fédéral et les provinces en matière d'éducation et de formation constituent l'obstacle principal à la formulation d'une politique nationale visant la constitution d'une main-d'oeuvre hautement qualifiée. La politique fédérale relative au financement des programmes établis n'a aucun effet

innovateur à cet égard, car les provinces considèrent les virements fiscaux comme des recettes non assorties de conditions. Le gouvernement fédéral devrait adopter de nouveau des programmes de subventions directes et des programmes à frais partagés pour différentes disciplines. Il devrait également créer une commission canadienne de la main-d'oeuvre professionnelle et technique, composée de représentants fédéraux, provinciaux et autres, et chargée de la recherche, de la planification et de l'octroi de subventions en matière de main-d'oeuvre.

L'aide financière aux étudiants devrait prendre la forme d'un programme de prêts remboursables où le remboursement se ferait selon le revenu du diplômé, au moyen de l'impôt sur le revenu. Le gouvernement fédéral devrait également mettre sur pied son propre programme de bourses afin de mieux répartir l'aide offerte aux étudiants dans les différentes provinces et faire en sorte qu'il y ait de plus grands écarts dans les frais de scolarité, selon les différents niveaux et domaines d'études, de manière à neutraliser plus rapidement les déséquilibres au sein du marché du travail.

Pour qu'une main-d'oeuvre hautement qualifiée puisse être constituée de façon satisfaisante, il faut de meilleurs renseignements pour l'évaluation et la formulation de lignes directrices, de même que pour la planification de carrière. A cette fin, le gouvernement fédéral devra élargir les programmes de collecte et d'analyse des données et mettre davantage l'accent sur la diffusion de renseignements et la création d'emplois pour les étudiants.

PREFACE

This study is presented in two parts. In Part One, the emphasis is on a quantitative description of highly qualified labour (HQL) in Canada, the current role of the federal government in developing HQL, and the historical/political evolution of this role. Part Two assumes the reader is familiar with the issues and information contained in Part One and proceeds to examine the effectiveness of the federal government's policies and programs in developing HQL. This is followed by proposals for modifications to or alternatives to the current role.

Highly qualified labour is usually defined in Part One as persons who have had two or more years in the post-secondary educational system or its equivalent in other countries. Since the development of HQL is therefore largely based on education institutions, the examination that follows must necessarily pay much attention to the federal government's support for post-secondary education and research.

ACKNOWLEDGEMENTS

Several people have provided essential assistance that made it possible to complete this report by the prescribed deadline in the midst of an academic term. Paul Hewitt and Richard Kalwa managed to find time in their already crowded schedules to serve as research assistants. Typing was done promptly and accurately by Rita Mollica at the Institute for Policy Analysis.

I am indebted to Dr. Zoltan Zsigmond of Statistics Canada for preliminary tables presenting the findings of a survey of 1976 post-secondary graduates.

CHAPTER 1

HIGHLY QUALIFIED LABOUR AND THE FEDERAL GOVERNMENT

DEFINITIONS OF HIGHLY QUALIFIED LABOUR

This report addresses the role of the federal government in the development of highly qualified labour. Two definitions or distinctions are immediately required. First, "development" is interpreted as augmentation of the stock of the trained population from which the long-run supply of labour is derived, as distinguished from the short-run supply and from utilization or demand. Short-run supply factors include participation rates and hours or weeks worked, while long-run supply is based on education and training, geographical and occupational mobility, and international migration. These are the factors on which this report focuses, with major emphasis on education and training.

The second distinction is between "highly qualified" and "highly skilled." The latter concept includes skills that are acquired both by formal instruction and on-the-job training, whereas "highly qualified" emphasizes formal qualifications acquired through post-secondary education. The distinction between "highly" and "moderately" qualified are of an even more arbitrary nature, but the following alternative definitions attempt to suggest some answers.

In this report, the term "highly qualified labour," or HQL, replaces the more widely used term "highly qualified manpower," or HQM. Definitions of highly qualified manpower have varied across time and jurisdictions. A federal government report of more than a decade ago suggested that there were at least the following four definitions of highly

qualified manpower.[1] These are listed together with the percentage of the labour force each group represented in 1961:

1. Those who have a university degree or equivalent (4.3%);

2. Those who are in the professional and technical occupational classification (10%);

3. Those who are in the professional and technical occupations plus employed (as distinct from self-employed) managers (15%);

4. All those who have some type of education or training which qualifies them for a specific occupation (30%);

The same report dealt with a survey of HQM which added a fifth definition, namely those with a university degree plus other members of the professional and technical associations.[2]

In 1973, a survey of HQM by Statistics Canada included only those who had a university degree at the time of the 1971 Census.

Recently, the Ministry of State for Science and Technology (MOSST) adopted a definition based on the Canadian Classification and Dictionary of Occupations (CCDO) which

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1 A.G. Atkinson, et al, Canada's Highly Qualified Manpower Resources, (Ottawa: Department of Manpower and Immigration, 1970).

2 Ibid., Appendix III.

specifies for each occupation the number of years of "General Education Development" (GED) and the "Specific Vocational Preparation" (SVP).[3] General educational development refers to education that adds to a worker's reasoning, mathematical, and language skills, but excludes training that has a specific occupational objective. Specific vocational preparation is "measured by the amount of time needed to acquire the information, techniques, and skills needed for average work performance in a specific occupation."[4] A four-year university program is considered equivalent to about two years of specific vocational preparation.

An HQM occupation in the MOSST definition is one with a GED/SVP index of 12 or higher. On the GED scale, schooling of 17 years or more is at level 6. The SVP scale defines level 6 as that requiring "over 1 year up to and including 2 years." Consequently, an index of 12 generally represents post-secondary non-university education, while a bachelor's or first professional degree is roughly equivalent to an index of 14.

The occupations thus defined as requiring HQM in the MOSST study are listed in Table 1, together with related but lower-ranked occupations for comparison. There are about 125 HQM occupational groups at the four-digit level, but this is somewhat misleading because some occupations, such as physicians and engineers, are included under both professional field (e.g., health or engineering) and education group.

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3 "MOSST HQM Demand Model Methodology", (Ottawa, University Branch, Ministry of State for Science and Technology, April, 1980), p. 44.

4 Canadian Classification and Dictionary of Occupations, vol. I, p. 1163.

TABLE 1

HIGHLY QUALIFIED MANPOWER (MOSST DEFINITION)[a]
BY OCCUPATION AND MAJOR GROUP, CANADA, 1971

Occupation	OCM Code	Occupation Totals	Group Totals
Health			
Dentistry	3113	6 425	
Medicine	3111	28 580	
Pharmacy	3151	9 410	
Nursing	3130-31	109 350	
Rehabilitation Therapy	3137	6 250	
Health Administration	1134	4 895	
Other HQM Health	3117-19-53	3 905	
			168 815
Engineering			
Architecture	2141	4 045	
Chemical Engineering	2142	3 460	
Civil Engineering	2143	21 445	
Electrical Engineering	2144	14 995	
Mechanical Engineering	2147	12 845	
Metallurgical Engineering	2151	835	
Aeronautical Engineering	2155	1 530	
Mining Engineering	2153	2 020	
Petroleum Engineering	2154	1 370	
Industrial Engineering	2145	14 675	
Engineering n.e.s.	2157-59	3 640	
			80 860
Life Sciences			
Veterinary Medicine	3155	1 715	
Dietetics and Nutrition	3152	1 790	
Agriculture and Related	2131	5 990	
Biology and Related	2133	2 965	
			12 460
Physical Sciences, Mathematics			
Geology	2112	4 690	
Meteorology	2114	760	
Chemistry	2111	7 140	
Physics	2113	740	
Mathematics	2181-89	3 760	
Computer Sciences	2183	22 475	
			39 565

Occupation	OCM Code	Occupation Totals	Group Totals
Humanities, Fine Arts			
Religion	2511-13-19	23 590	
Library and Archival	2350-51	8 405	
Translation	3355	2 000	
Other HQM Humanities and Fine Arts	3311-13-14-30-32-33-52	50 565	
			84 560
Education			
Univeristy Teaching	2711	23 455	
Elementary and Preschool	2731	146 065	
Secondary School	2733	111 105	
Community College Teaching	2791	8 980	
Other HQM Education	2719-39-92-93-95 2391 and 1133	77 695	
			367 300
Law			
Law	2341-43	17 585	
			17 585
Commerce, Administration			
Government Officials and Administrators	1111-13-15-16-19	39 405	
Commissioned Officers	6116	16 410	
General Administration	1130-31-32-35-36-37-41-42-43-45-47-49	110 760	
Related Management Occupations	1174-75-76-79	79 655	
Accounting	1171	103 020	
Technical Sales	5131	5 955	
Supervising - Sales and Services	5170	24 650	
Sales, Securities	5173	7 795	
Farm Management	7131	19 695	
			407 345

Occupation	OCM Code	Occupation Totals	Group Totals
Social Sciences			
Social Work	2331-99	13 180	
Psychology	2315	3 885	
Economics	2311	5 620	
Sociology, Anthropology and Related	2313	435	
Other Social Sciences and Related n.e.s.	2319	1 565	
			24 685
Total			1 203 175
Total Labour Force			8 626 925
HQM Occupations as Percentage of Total			13.95

a see text for definition

OCM Occupational Classification Manual, 1971 Census

n.e.s. not elswhere specified

Sources: for HQM occupations - "MOSST HQM Demand Model Methodology", University Branch, Ministry of State for Science and Technology, draft report, Table 5.
for statistics - 1971 Census, Occupations, vol. III - Part 2, No. 94-723, Statistics Canada

Statistics Canada has adopted a different definition of HQM occupations, namely those requiring two or more years of post-secondary education.[5] This definition is based on only the GED index and omits any reference to the SVP index. The Statistics report notes, however, that "some adjustments [to the 1971 Occupational Classification Manual] were made to update the GED levels,"[6] recognizing that the minimum education requirements for employment in certain occupations have been rising with the expansion of the post-secondary system. The number of persons included in the Statistics Canada definition are shown in Table 2.

Statistics Canada estimated that there were about 1.4 million persons employed in HQM occupations in 1975 and that HQM jobs were increasing at a rate of about 50,000 per year.[7]

The quantitative significance of alternative definitions of the HQL group is illustrated by the following data based on the 1971 Census (items 5, 6, 7) or on the April 1972 Labour Force Survey:

Number and percentage of the total labour force with:

1.	University degree;	725,000	8.4%
2.	Univeristy degree plus some university;	1,050,000	12.1%

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5 Z. Zsigmond, G. Picot, W. Clark and M.S. Deveraux, Out of School - Into the Labour Force, Statistics Canada, No. 81-570, (Ottawa: Supply and Services Canada, 1978) p. 154.

6 Ibid.

7 Ibid., p. 156.

TABLE 2

HIGHLY QUALIFIED MANPOWER (STATISTICS CANADA DEFINITION) IN THE CANADIAN LABOUR FORCE, 1972*

Level of Schooling	Percentage	Number
Non-university		
Some	3.5	302
Complete	6.4	557
University		
Some	3.7	325
Complete	8.4	725
Subtotal	22.0	1 909
Total Labour Force	100.0	8 677

* Data are not directly comparable with the data in Table 1. The Census data are for June , 1971; the data here are from the Labour Force Survey of April, 1972.

Source: Statistics Canada, Education in Canada, 1973, p. 521.

3.	University degree plus other post-secondary diploma;	1,282,000	14.8%
4.	Two or more years post-secondary education;	1,909,000	22.0%
5.	Professional occupations;	616,085	7.1%
6.	Professional and managerial (employees) occupations;	973,065	11.3%
7.	MOSST HQM Index of 12 or higher	1,203,175	14.0%

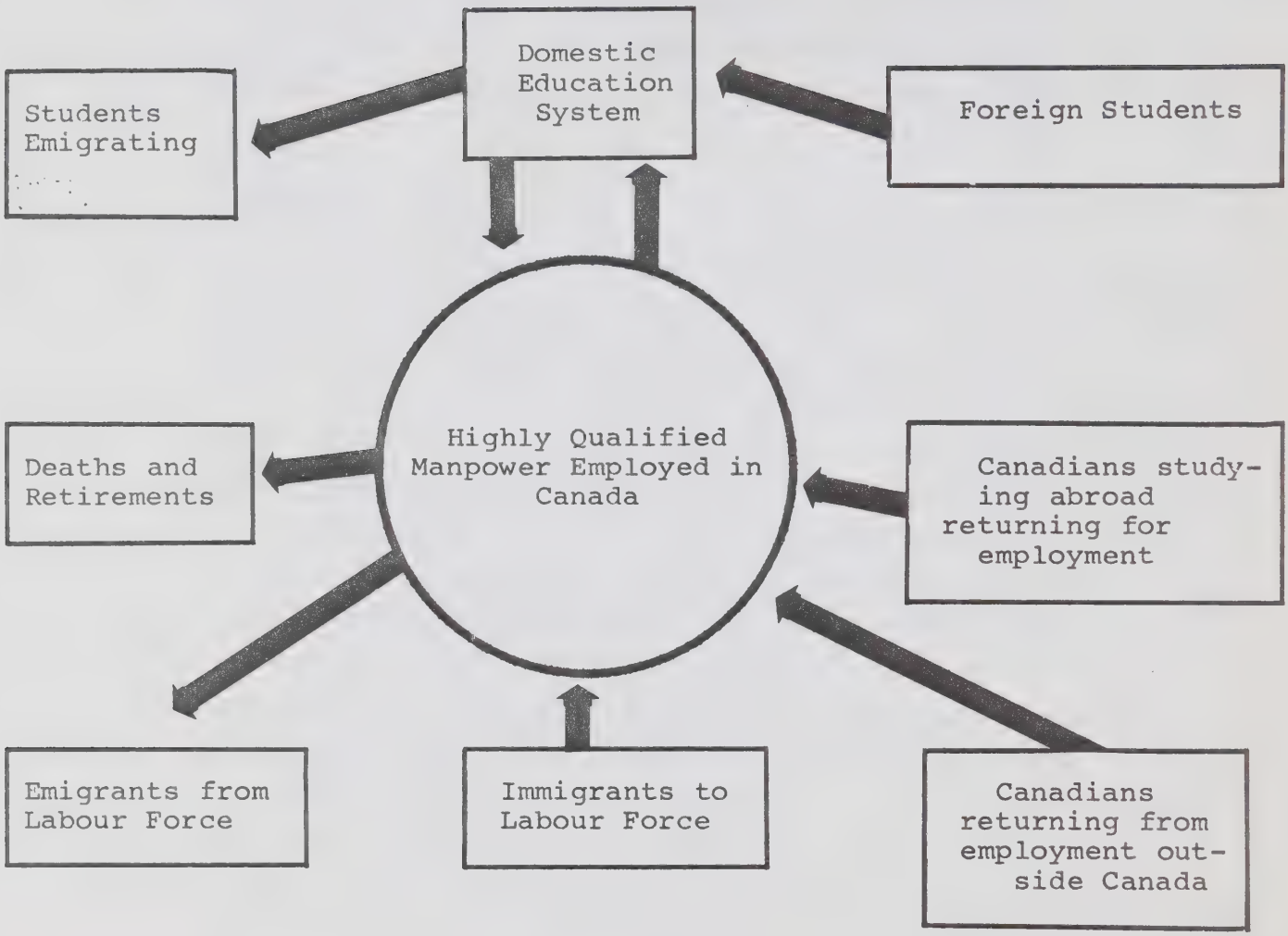
These data emphasize that there are substantial differences among the several definitions of "highly qualified labour." Two of these which seem most suitable conceptually are also the most inconvenient to use operationally. These are the MOSST definition and "university degree or other post-secondary diploma." The MOSST definition requires disaggregated census data that are available only decennially, are based on occupational classifications that have changed with each census, and require that occupational data be aggregated differently from the standard broad occupational groups. The definition based on post-secondary certificates is also difficult because the census does not provide these data, nor do they appear in aggregated form in the education publications of Statistics Canada. Consequently, this report makes observations based on various of the HQL definitions but deals mainly with the Statistics Canada definition as persons with two or more years of post-secondary education.

DEVELOPMENT AND MAGNITUDE OF HIGHLY QUALIFIED LABOUR

Sources of highly qualified labour in Canada are summarized in Figure 1. This serves as a reminder that the HQL stock depends not only on the Canadian educational system but also on the net international migration of both students and workers, as well as on out-flows caused by deaths and retirements. The emphasis in this study, however, is on the

FIGURE 1

FLOWS OF HIGHLY QUALIFIED MANPOWER



Source: A.G. Atkinson, et al, Canada's Highly Qualified Manpower Resources, (Ottawa: Department of Manpower and Immigration, 1970), Figure 3.1.

educational system because other factors are dealt with in other Task Force reports.

Tables 3 to 7 trace flows through the post-secondary system, from enrolments to graduates to labour force entrants, by level and field of study. Table 3 shows the actual and projected growth rates of full-time enrollment from 1971 to 1986. Non-university and undergraduate enrollments are either just past or are now at their peaks. Graduate enrollment is expected to continue increasing for at least the next six years. Most important, the non-university career and university undergraduate enrollments in 1986-87 are expected to be at about the same level they held in 1974-75.

Indirectly these data also emphasize the relative importance of non-university institutions. Whereas these were negligible prior to the 1940s and were of minor significance in the 1950s and 1960s, they now account for 35 to 40 percent of full-time enrollment. This has not only increased the stock of HQL but has also substantially differentiated the quality of labour, especially in technology and applied arts. Graduate studies were also a quantitatively insignificant part of Canadian universities until the 1960s, but now represent about 10 percent of full-time university enrollment. Graduates with advanced degrees (especially Ph.D. degrees) have recently found employment in areas other than university teaching.

TABLE 3

FULL-TIME ENROLMENT INDEX FOR POST-SECONDARY EDUCATION, CANADA, 1971-72 TO 1986-87

(1971-72 = 100, index in brackets)

Year	Non-University		University		
	Transfer	Career	Bachelor, Prof. Degree	Master	Doctorate
			(Enrolment in thousands)		
1971-1972	54.8 (100)	118.9 (100)	287.1 (100)	21.4 (100)	10.0 (100)
1974-1976	72.4 (132)	140.2 (118)	309.5 (108)	21.9 (102)	9.4 (94)
Projected					
1977-1978	82.0 (150)	161.5 (136)	333.5 (116)	23.7 (111)	9.5 (95)
1980-1981	70.0 (128)	160.2 (135)	341.0 (119)	24.7 (115)	9.5 (95)
1983-1984	64.4 (118)	156.6 (132)	339.9 (118)	26.2 (122)	10.1 (101)
1986-1987	56.4 (103)	139.1 (117)	309.6 (108)	27.8 (130)	11.0 (110)

Source: Z. Zsigmond, et al, Out of School - Into the Labour Force, 1978, Tables 17 and 18.

The gradual shift in fields of study for university undergraduates is shown in Table 4. Percentages in arts and science rose sharply but peaked in the late 1960s as the increasing demand for secondary school teachers was satisfied. About one half of the undergraduates are now in arts and science. Enrollments in commerce and business administration have risen steadily since the mid-1960s and may not yet have reached a peak. Engineering enrollments have always fluctuated in response to economic cycles. Enrollments in fine and applied arts, while a small part of the total, have shown one of the strongest growth rates. In the health fields of dentistry, medicine, nursing, and pharmacy, enrollments have remained at about the same proportion (6 percent) over the past 15 years. Although the change in percentages in law appear small, this marks a dramatic increase in enrollments in that field - especially in Ontario - in the past 10 years.

In Tables 5 and 6, one can see the results, in terms of graduations, of the enrollment changes observed in Tables 3 and 4.

The data in Tables 7 show the transposition from post-secondary graduates to labour force entrants. This shows that there will be little change over the next six years in additions to HQL stock from the post-secondary system; that the composition of these additions will be unchanged (with about one half entering with "some post-secondary" but no diploma or degree); and that, nevertheless, post-secondary entrants will represent an increasing proportion of the new entrants to the labour force. This approximately constant number of new entrants, despite a small decline in post-secondary graduates, is largely explained by the higher labour force participation rates of the highly educated population. These are shown for 1977 in Table 8. The lower rates for males in the 25-34 age

TABLE 4

PERCENTAGE DISTRIBUTION OF FULL-TIME UNIVERSITY UNDERGRADUATE ENROLMENT, BY FIELD OF STUDY, CANADA, 1960 TO 1977

Field of Study	1960	1965	1970	1975	1977
Arts and Science	49.7	57.2	56.0	48.9	49.3
Agriculture	1.7	1.3	1.4	1.4	1.4
Commerce, Bus. Admin.	6.1	5.7	6.1	9.1	10.0
Education	10.8	12.9	14.0	13.6	13.5
Engineering	15.0	10.0	9.3	9.3	10.4
Fine and Applied Arts	.5	.7	2.0	3.5	3.6
Dentistry	1.0	.7	.6	.6	.6
Medicine	4.0	2.5	2.1	2.7	2.6
Nursing	1.6	1.7	11.6	1.9	1.7
Pharmacy	1.4	.9	.8	.8	.9
Misc. Health Programs	.6	.6	.9	.9	.8
Household Science	1.5	1.2	1.1	1.3	1.2
Law	2.3	2.2	2.6	2.7	3.0
Religion and Theology	3.1	1.5	1.0	.7	.6
Veterinary Medicine	.4	.3	.3	.3	.3
Unclassified	.5	.7	.6	2.4	.3
Total Number (thousands)	107.4	188.7	323.6	307.7	312.6
Percent	100.0	100.0	100.0	100.0	100.0

Source: Statistics Canada, Fall Enrolment in Universities, No. 81-204, (Ottawa: Information Canada, 1978).

TABLE 5

GRADUATES FROM POST-SECONDARY EDUCATION, CANADA 1972 to 1987

(Thousands)

Year	Non-University		University			
	Transfer	Career	Undergrad. Diploma	Bachelor, Prof. Degree	Master[a]	Doctorate
1972	12.1	32.0	8.0	72.6	11.2	1.7
1975	17.1	36.1	8.0	80.6	12.1	1.8
Projected						
1978	18.6	41.6	9.6	87.4	13.3	1.8
1981	16.5	44.3	10.7	89.5	14.0	1.8
1984	15.5	44.5	9.6	92.5	15.1	1.9
1987	12.9	39.4	8.6	90.6	16.0	2.1

a Includes graduate diplomas.

Source: Z. Zsigmond, et al, Out of School - Into the Labour Force, 1978, Table 2, p. 69, and Table 22, p.320.

TABLE 6

BACHELOR'S AND FIRST PROFESSIONAL DEGREES AWARDED,
BY FIELD OF STUDY, CANADA, SELECTED YEARS 1961-62 TO 1977-78
(Percentage Distribution)

Field of Study	Year Ending:	1962	1967	1972	1977	1978
Agriculture		1.5	1.2	0.9	1.0	1.0
Arts		40.1	47.6	40.9	36.6	n.a.
Science		8.4	9.7	12.1	12.1	n.a.
Commerce, Business Administration		5.0	4.3	5.0	7.5	8.8
Education		15.0	16.3	20.2	19.6	21.9
Engineering		10.7	5.6	5.6	5.0	5.7
Law		2.9	2.5	3.0	3.1	3.4
Medicine		3.7	2.3	2.1	2.3	2.5
Other		12.7	10.5	10.1	12.8	n.a.
Total	Number	22,836	43,227	72,564	87,570	89,282

Source: Statistics Canada, Universities: Enrolment and Degrees, No. 81-204.

TABLE 7

PERCENTAGE DISTRIBUTION OF POTENTIAL HIGHLY QUALIFIED LABOUR FORCE ENTRANTS FROM THE EDUCATION SYSTEM, CANADA, 1966 TO 1986

	POST - SECONDARY EDUCATION					
	Some[a]	Certificate[b] or Diploma	Bachelor, 1st Prof. Deg.	Master, Doctorate	Total 100%	Total Post-Secondary as percent of all entrants
					(thousands)	
1966	31	31	32	4	66.8	19
1971	47	22	26	5	150.3	29
1975	51	19	26	4	191.0	35
Projected						
1979	51	21	24	4	216.4	37
1983	51	20	25	4	222.0	40
1986	51	19	26	5	212.6	42

a Includes CEGEP general graudates in Quebec and university transfer Students in other provinces

b Non-university career programs or undergraduate diploma programs.

Source: Z. Zsigmond, et al, Out of School - Into the Labour Force, 1978, Table 4.

TABLE 8

ANNUAL AVERAGE LABOUR FORCE PARTICIPATION RATES[a] FOR HIGHLY EDUCATED POPULATION, BY AGE AND SEX, CANADA, 1977

	Some Post-Secondary	Diploma or Certificate	Degree
Males (Age)			
25-34	94.6	96.7	95.6
35-44	97.6	98.5	98.6
45-54	95.4	96.3	98.1
55-64	83.3	83.5	86.6
Females (Age)			
25-34	59.2	64.3	72.8
35-44	65.8	65.7	70.3
45-54	57.6	64.2	68.8
55-64	40.8	47.2	52.0

Notes: [a] Percentage of persons who completed the education level shown who were in the labour force; annual averages were based on monthly Labour Force Survey.

Source: G. Picot, The Changing Education Profile of Canadians, 1961 to 2000 (Ottawa: Statistics Canada, 1980), Table 4.

class result partly from students who are in the labour force part time while pursuing a higher level of education.

The consequence of increasing enrollments and graduations, at least to the present, and of higher participation rates for post-secondary graduates is the increasing proportion of the labour force represented by HQL. This is displayed in Table 9. Highly qualified labour force (defined as those with at least some post-secondary education) is expected to be 43 percent of the male labour force and 48 percent of the female labour force by the year 2000. The most dramatic increase has already occurred - from 13 percent of the total labour force in 1961 to 34 percent currently.

The HQL group has increased more rapidly than the rest of the labour force - with an average annual growth rate of over 12 percent from 1972 to 1980 compared with a rate of about 1.5 percent annually in the rest of the labour force - but this growth has occurred in sectors where explicit policy decisions make it clear that growth will be much slower over the next decade or two. These include government administration, education, health care, and welfare.

The assumptions on which these forecasts are based are shown in Table 9 and should be noted carefully. Most important is the assumption that the post-secondary enrollment rate will decline to 1985 but then increase for the following 15 years.

TABLE 9

HIGHLY QUALIFIED LABOUR AS A PERCENTAGE OF TOTAL LABOUR FORCE, CANADA, 1961 TO 2000

	Actual			Forecast		
	1961	1972	1977	1980	1990	2000
Males						
Some Post-Secondary			10.0	10.5	12.0	13.4
Certificate or Diploma			9.8	10.6	12.4	13.2
University Degree			11.0	11.8	14.6	16.1
Total			30.8	32.8	39.0	42.7
Total Labour Force (Millions)			6.6	7.0	7.8	8.5
Females						
Some Post-Secondary			10.2	10.9	12.9	14.8
Certificate or Diploma			14.7	15.8	17.9	18.7
University Degree			7.9	8.9	12.1	13.7
Total			32.8	35.5	42.9	47.2
Total Labour Force (Millions)			4.0	4.5	5.8	6.4
Total						
Some Post-Secondary	4.2	7.2	10.1	10.6	12.4	14.0
Certificate or Diploma	3.9	6.4	11.7	12.6	14.7	15.6
University Degree	4.7	8.4	9.8	10.6	13.5	15.1
Total	12.8	22.0	31.6	33.9	40.6	44.6
Total Labour Force (Millions)	6.5	8.7	10.6	11.5	13.7	14.9

Table 9 cont'd.

Definitions:

"Some post-secondary": entered a post-seocndary program but did not receive a certificate, diploma or degree.

"Post-secondary certificate or diploma": completion of a program requiring secondary school graduation for admission (primarily community college, technical school, university undergraduate diplomas, and certificates.)

"University degree": a bachelor's, master's or doctoral degree or graduate diploma.

Assumptions:

1. Decline in fertility rate from 1.9 in 1976 to 1.7 by 1991, constant thereafter.

2. No significant change in elementary-secondary enrollment rates.

3. Post-secondary enrollment rate (based on 18-24 age group) declines from 19.2% in 1978 to 17.3% in 1985 and increases to almost 20% by 2001.

4. Labour force participation rates for females to increase from 46% in 1977 to 53% by 1986 to 55% by 2000; and for males, a slight rise from 77.7% in 1977 to 78.4% in 1986, and a drop to 76.1% by 2000. Participation rates for all educational levels within each age group were changed at the same rate.

Source: G. Picot, The Changing Education Profile of Canadians, 1961 to 2000, (Ottawa: Statistics Canada, 1980); and Z. Zsigmond, et al, Out of School-Into the Labour Force, 1978.

RATIONALE FOR FEDERAL INVOLVEMENT

The innumerable specific reasons for government intervention or participation in functions that are otherwise carried out by private market transaction are usually grouped under three categories: allocation, stabilization, and distribution. Consider these briefly in reverse order - because the major attention will be given to allocation. "Distribution" is actually a matter of redistribution. To the extent that the distribution of goods and services (or the real incomes representing a claim to these) resulting from market transactions is considered socially or politically unacceptable, this is modified by government actions such as transfer payments through taxation and grants or subsidies. Both federal and provincial governments have attempted to redistribute income toward lower-income families through the post-secondary system, for example by bursaries and subsidized student loans.

Stabilization refers to governments' actions intended to reduce economic fluctations and particularly to maintain low rates of inflation and unemployment. Training programs are expected to contribute to these objectives by reducing cost-push inflation associated with skill shortages and by reducing structural unemployment when unemployed persons are retrained for occupations where demand is stronger.

The allocation argument for government intervention in labour markets (and in the education markets which supply them) is that these markets could be made more efficient in allocating resources to their most productive uses. The markets are said to be defective in two ways: that they are imperfect due to time lags, lack of information, control of the market by only a few persons or organizations, etc.; and that market transactions between buyer and seller do not take

account of economic effects of consequences for third parties. These third-party, spillover, or neighbourhood effects are technically termed externalities and may be either positive or negative.

In the case of labour markets - particularly in markets for highly qualified labour - imperfections result in conditions perceived to be "shortages" or "surpluses." Several different conditions have been given these labels. It is not possible to discuss these here; instead it is enough to note that when there are shortages or surpluses, governments are often expected to intervene to reduce the imbalance.

Externalities said to be associated with HQL have ranged from the invaluable contribution of research and development through to public leadership. More specific examples would include, for example, the value of increased productivity of workers whose health and longevity is improved by physicians.

Higher levels of government are involved when the activities concerned span jurisidictional boundaries, or when there are spillover effects which a lower-level government would ignore. Consequently, the federal government has responsibility for overall management of the economy. This poses difficulties when the British North America Act assigns responsibility for education to the provinces, but leaves economic management to the federal government. Much post-secondary education is actually vocational training directly related to general economic needs. As the HQL group becomes a larger part of the labour force this conflict will become more apparent and more politically difficult to resolve.

Although the federal government has been actively involved in vocational training for at least 70 years - as

the next chapter shows - the official rationale for federal involvement in post-secondary education has been restricted to a concern for:

> accessibility to post-secondary education; ...to rationalize on a national basis the use of existing post-secondary education resources; bilingualism in education; and the ... greater knowledge and understanding of Canada.[8]

The federal government also has a unique and important interest in the development of HQL because it is the largest single employee of highly qualified labour. Data are not available in sufficient detail to calculate the federal government's HQL force by either of the Statistics Canada or the MOSST definitions, but proxy estimates are given in Table 10. The federal government employed in 1971 about 74,000 persons in managerial and professional occupations. This represented 22 per cent of the total federal labour force, while in the Canadian labour force those two occupations contributed only 17 percent. Employees with some university or a university degree were 28 percent of total federal employees.

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8 P.E. Trudeau, Statement on Established Program Financing, 1979, quoted in Peter Leslie, Canadian Universities, 1980 and Beyond, (Ottawa: Association of Universities and Colleges of Canada, 1980), p. 377.

TABLE 10

HIGHLY QUALIFIED LABOUR EMPLOYED IN THE FEDERAL ADMINISTRATION (CIVIL PLUS DEFENSE), BY OCCUPATION AND EDUCATION, CANADA, 1971

Occupation	Number
Managerial	37 175
Professional	36 400
Science, Engineering	21 435
Social Sciences, Law	5 375
Religion	80
Teaching	3 810
Medicine and Health	3 075
Artistic, Recreation	2 625
Total Managerial and Professional	73 575
(% of total)	22
All Occupations	328 775

Education	
Some university	44 100
University degree	46 900
Total post-secondary	91 000
(%)	28
Total employees	328 775

Source: Statistics Canada, 1971 Census, Industries, Bulletin 3.5-2 and Economic Characteristics: Occupation by Industry, Special Bulletin 94-792

CHAPTER 2

EVOLUTION OF FEDERAL GOVERNMENT INVOLVEMENT IN DEVELOPMENT OF HIGHLY QUALIFIED LABOUR

The federal government has been involved in post-secondary education since it founded the Royal Military College in 1884. Substantially more important roles have evolved through financing of technical and vocational training, grants to universities and colleges, financial assistance for students, and grants for graduate study administered by the research councils. The historical development of each of these programs is summarized in the following four sections.

TECHNICAL AND VOCATIONAL TRAINING

Almost every account of the federal government's involvement in the financing of technical training or post-secondary education begins with either the Agricultural Aid Act of 1912 or the Technical Education Act of 1919. But these acts have a greater significance than simply marking federal assistance. The circumstances under which the acts came into existence and their specific provisions show that they are the direct antecendents of federal support for post-secondary education.

Agricultural Instruction

The Conservatives, while campaigning in the 1911 election as the opposition party, had said that they were in favour of "granting liberal (sic) subsidies to the provinces for the purpose of supplementing and extending the work of

agriculture."[1] When they gained power in 1911, they immediately sought a course of action to implement their campaign proposals.

The Agricultural Aid Act, passed in April, 1912, contained only two broad provisions;

> The Governor in Council may, in any year, and upon such terms and subject to such conditions as are prescribed by order in council, grant to any provinces, for the encouragement of agriculture, a subsidy not exceeding such sum as may in such year be voted by Parliament for the purpose.

and that:

> The Minister of Agriculture, with the authority of the Governor in Council, may enter into an agreement with the Government of any province setting forth the terms upon which such subsidy is granted, and prescribing the conditions under which and the purposes for which it shall be expended.

Within a year, the Minister of Agriculture introduced a Bill for the granting of Aid for the Advancement of Agricultural Instruction in the Provinces.[2] This became the Agricultural Instruction Act of 1913. Agricultural education was seen as the best means for stemming the flow of young people to the cities. But constitutional rights of the provinces to legislate for education were to be respected: "...in respect of funds applied to education we propose to follow what may fairly be termed constitutional lines, using and strengthening the machinery already existing in the

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1 Montreal Gazette, August 15, 1919; cited in J.A. Maxwell, Federal Subsidies to the Provincial Governments in Canada, (Cambridge, Mass.: Harvard University Press, 1937), p. 199. Quoted by the Minister of Agriculture (Martin Burrell) in the Common on January 24, 1913.

2 Canada, House of Commons Debates, Vol III: (1912-13): 2148 ff.

provinces, or by them properly established." Such "machinery" would include the agricultural colleges, establishment of agricultural schools, the initiation of agricultural teaching in the public schools and work by travelling qualified instructors.

The program was to extend over 10 years (1913-22) with $10 million allotted for this period, but the act was later extended for another year with a grant of $900,000. Basically the funds were to be divided among the provinces on a population basis but there were some modifications. "Such veterinary colleges as grant degrees and come up to a required standard" each received $20,000 a year. The reason for this modification is of continuing significance. The Minister of Agriculture was careful to note that, "We do this on the ground that from the character of our federal veterinary work, and for the reasons that students to these institutions are drawn from all provinces in Canada, they may be regarded as having a fairly national complexion."[3]

Furthermore, $20,000 per year was allotted to each province regardless of population to take account of "those provinces whose rural population is of large proportions, whose sources of revenue are limited and whose agricultural development greatly needs stimulation."

Royal Commission on Industrial Training and Technical Education

Throughout the first decade of this century there had been pressure on the federal government to provide funds for

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3 Emphasis added.

technical education. When a proposal was introduced by the government to appoint a royal commission to examine technical education, the bill's sponsor, Hugh Guthrie, noted that the major objection to the commission might be that it infringed on the jursidiction of the provinces in matters of education. But his defense against this objection was based on the use of the terms "education" and "training."

> Unfortunately, the term used, I think universally, in the English speaking world, to describe this particular kind of training, is technical education. A more correct phrase, to my mind, would be industrial training and probably, if the phrase were industrial training and not technical education, there would be less objection.[4]

Guthrie argued that when the British North America Act was passed in 1867 technical education was unknown and was thus not contemplated in the original understanding of section 93. He suggested that education should be defined as "that course of instruction which we give to the youth of the country in the public schools, the high schools, the collegiate institutes and the universities."[5] The latter was described as "entirely a scholastic training, one destined to turn out cultural and refined scholars" but technical education was "a matter of economics rather than of culture." Moreover, Guthrie continued, the demand for technical education came from working-class parents rather

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4 Canada, House of Commons Debates, vol. I (1909-10): 1026.

5 Ibid., p. 1027

than from parents who could afford a university education for their children.

Guthrie further argued that his proposal did not contravene section 93 because the proposal was more properly considered under section 91 which gave the federal government jurisdiction over matters of trade and commerce. Technical training was expected to improve the quality, quantity, and distribution of manufactured goods.

Guthrie then turned to the case of the Royal Military College which offered a general education but "this is a matter of militia and defence, over which this government has exclusive jurisdiction. Might we not say the same of industrial training as related to the trade and commerce of the country."[6]

The commission was appointed in June 1910, and reported three years later. It recommended that manual training be included in school programs from kindergarten to age 11 or 12, "and bearing in mind that such school work was not contemplated as part of public education at the time of Confederation...," the commission recommended that the federal government provide $350,000 per year for 10 years, on a provincial population basis, to assist the provinces in such training.

In setting out the "underlying principles" for the organization of industrial training and technical education n Canada, the commission stated that this "should be under provincial control and regulation" but should receive financial support from individuals, local authorities,

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6 Ibid., p. 1029.

provincial governments and from the federal government."[7]

The commission proposed a Dominion Development Policy which included a Dominion Development Fund of $3,000,000 annually for 10 years, to be provided by the federal government. Not less than 75 per cent of the funds was to be allocated to each province in proportion to their populations. The balance was to remain in a general account for distribution by the Dominion Development Commission. Payments from the fund were to be for teachers, schools, equipment, scholarships, and research.[8]

Technical Education Act, 1919

The World War of 1914-18 caused action on the commission's report to be postponed. However, the war also had the effect of both slowing school construction and demonstrating the need for developing technical skills. Miller points out that:

> both the Dominion and the Provincial Governments realized that they would have to provide special financial aid over a period of years. This realization led to the passage of the Technical Education Act, 1919, by the Dominion Government and the provincial legislation necessary to enable the provinces to receive the grants provided."[9]

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7 Canada, Royal Commission on Industrial Training and Technical Education, Report, p.2

8 Ibid., p. 38

9 J.C. Miller, National Government and Education in Federated Democracies: Dominion of Canada (Phila.: the author, 1940), pp. 312-313.

Under the Act, technical education was defined as:

> ...any form of vocational, technical or industrial education or instruction, approved by agreement between the Minister [of labour] and the Government of any province as being necessary or desirable to aid in promoting industry and the mechanical trades, and to increase the earning capacity, efficiency and productive power of those employed therein.[10]

The Act provided for an aggregate sum of $10 million to be paid over 10 years to assist technical education as described above. The allotment was $700,000 in the first year, rising by $100,000 per year to $1,000,000 in the fifth year and each year following to 1929. Each province was to receive $10,000 annually with the balance distributed in proportion to the provincial population.[11]

These funds could be used for:

1. Purchase or rental of land, buildings, furnishings and equipment.
2. Remuneration and travelling expenses of persons employed for the purpose of administration of vocational education and all expenses incidental to such administration.
3. Remuneration of teachers employed to conduct vocational classes.
4. Training of teachers for vocational work.
5. Maintenance of plant and equipment.[12]

The government announced that it intended to let the Act lapse in 1929 since the provinces had been given a start in an area that was primarily their responsibility. This announcement met considerable protest, especially from the

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10 Statutes of Canada, 9&10 George V, C.73, S.2 (1919)
11 Ibid.
12 Canada, Department of Labour, Annual Report, 1919-20, p. 146.

Conservative opposition. By 1929, only Ontario had received the full amount of its allotment under the Act.[13]

The government therefore passed the Technical Educatiion Extension Act of 1929. This Act permitted any unexpended portion of the $10 million to be carried forward and to be available under the terms of the original act during the succeeding five years, to 1934.[14] But the Depression led the provincial governments to curtail sharply their expenditures for technical education such that, in 1934, the federal government extended the Act for a further five years to permit Saskatchewan, Manitoba, and Nova Scotia to recieve their allotments.[15] Payments made by the federal government to the provinces are shown in Table 11.

Maxwell offers an evaluation of the effectiveness of the Act:

> The greatest weakness of the Technical Education Act was the inadequate administration which it was given. Compared indeed with the agricultural instruction act, there was improvement. The very fact that the federal grants had to be matched put some check - doubtless very rough and ready - upon expenditure. Besides, a more precise plan was drawn up in advance, and more rigid limitations were put into the provincial agreements.
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> ...[But] The provinces had, in the main, to be permitted to go their own road. The result was a heterogeneity of standards, with much work of an unsatisfactory quality.[16]

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13 Maxwell, Federal Subsidies..., 1937, states that in 1929 Ontario was spending over $1,000,000 on vocational education, much more than enough to earn the federal subsidy.

14 Statutes of Canada, 19&20 George V., C.8 (1929)

15 Maxwell, Federal Subsidies..., 1937, p.210.

16 Ibid. pp.211-212. A detailed description of programs in each province is provided in Donald Glendenning, A Review of Federal Legislation Relating to Technical and Vocational Education in Canada, (Ottawa: Department of Manpower and Immigration, 1968).

TABLE 11

PAYMENTS BY DOMINION TO PROVINCES UNDER TECHNICAL EDUCATION ACT, 1919, AND EXTENSIONS

Year	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
1919/20	$	$	$ 3 397	$ 36 500	$ 106 298	$ 2 648	$ 1 142	$ 17 108	$19 408	$186 501
1920/21	2 701	24 193	10 409	167 887	294 112	7 268	3 534	41 438	29 134	580 676
1921/22	7 242	32 758	22 161	114 651	378 175	21 174	13 665	82 606	47 904	720 336
1922/23	5 858	33 166	17 476	128 182	314 207	25 121	18 264	71 020	34 932	648 226
1923/24	6 551	35 502	20 382	328 682	347 636	20 092	18 397	57 614	53 535	888 391
1924/25	1 951	34 624	43 041	263 400	347 636	19 500	17 249	62 216	40 860	830 477
1925/26	7 255	31 000	93 874	299 144	347 636	19 489	20 084	72 732	53 123	944 337
1926/27	7 757	31 495	76 209	403 944	347 636	20 056	18 022	85 789	56 627	1 047 535
1927/28	11 982	29 225	70 107	329 072	347 636	27 530	17 048	74 000	59 355	965 955
1928/29	20 370	47 083	48 638	372 891	347 636	28 527	25 160	92 222	169 637	1 152 164
1929/30	22 117	21 525	51 951	125 302	-	41 542	60 506	21 780	68 564	413 287
1930/31	30 790	73 670	50 026	-	-	38 621	198 290	-	-	391 397
1931/32	31 899	48 700	4 792	-	-	27 488	170 095	-	-	282 974
1932/33	29 371	50 629	-	-	-	46 169	75 568	-	-	201 737
1933/34	12 345	47 692	-	-	-	23 064	45 971	-	-	129 072
1934/35	-	39 616	-	-	-	9 431	41 673	-	-	90 720
1935/36	-	48 766	-	-	-	2 655	47 363	-	-	98 784
1936/37	-	32 471	-	-	-	22 217	21 534	-	-	76 222
1937/38	-	-	-	-	-	14 813	34 056	-	-	48 869
Total	$198 189	$662 115	$512 463	$2 569 655	$3 178 608	$417 405	$847 621	$678 525	$633 079	$9 697 660

Source: Miller, National Government and Education..., 1940

Unemployment and Agricultural Assistance Act of 1937

The Youth Training Committee of the National Employment Commission in 1936-37 conducted an extensive study of training and employment schemes for the increasing number of unemployed young people. These included the establishment of the National Volunteer Forest Service, National Volunteer Aviation Service, Young Men's Training Centres, and employment projects in mining and agriculture. The report stressed the importance of a "continuing policy" and of adequate counselling, guidance and placement services.[17]

The legislation based on their report was The Unemployment and Agricultural Assistance Act of 1937.[18] This act provided for the training of men and women between the ages of 18 and 30 years who were unemployed and registered with the Employment Service. Grants were to be made in matching amounts with provincial expenditures, but were not required to be in proportion to the provincial populations. An appropriation of $1 million was voted for the National Employment Commission under the Department of Labour to be spent in the 1937-38 fiscal year.

Youth Training Act of 1939

The Unemployment and Agricultural Assistance Act of 1937 had been re-enacted once in 1938, and was to be re-enacted again in 1939 and 1940. When it was time to renew these annual agreements in March, 1939, the federal government

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17 Donald Glendenning, Review of Federal Legislation..., 1968.

18 Statutes of Canada, I George VI, C.44 (1937)

introduced a new act, the Youth Training Act, or "an Act to provide for the Training of Young People to fit them for Gainful Employment." This was passed in the early summer of 1939. The appropriation of $1,500,000 per year was to provide for young people between the ages of 16 (reduced from 18 under the previous act) and 30 years, "who were not gainfully employed and whose families are not in a position to pay the full cost of their training, and who are registered for the employment with the Employment Service of Canada."[19] The program was carried on by agreements with each province, with federal government paying 50 percent of the approved expenditures.

Vocational Training Co-ordination Act of 1942

The Youth Training Act of 1939 expired in March 1942. This was replaced by the Vocational Training Co-ordination Act. The term "Co-ordination" in the title was quite appropriate since:

> This Act provided for the continuation of projects begun under the Youth Training Act of 1939, the training of individuals in war industries and the armed forces [War Emergency Training Program], the training of war veterans [described in a later section], the unemployed [under the Unemployment Insurance Act], persons involved in conservation and development of natural resources, apprentice supervisors in industry, and for promotion of research and dissemination of information. In addition, vocational training at a level equivalent to the secondary school level was encouraged.[20]

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19 Statutes of Canada, Pts. I-II, 3 George VI, C.35, (1939); 269.

20 Glendenning, Review of Federal Legislation..., 1968.

An innovation in the Act was the establishment of a Vocational Training Advisory Council to advise the Minister of Labour on matters relating to vocational education. Programs under the act were to be carried on through federal-provincial agreements concerning apprenticeship, vocational schools, correspondence courses, and technical training.

Technical and Vocational Assistance Act of 1960

Federal government involvement in technical and vocational training prior to 1960 had been expressed through agreements signed separately with each province to assist in different aspects of training programs, under the Vocational Training Co-ordination Act of 1942. These several programs had developed as specific needs arose, with little attention paid to a co-ordinated, general approach to technical training. But by 1960 the unemployment level, especially of unskilled persons, was increasing more quickly and the immigration of skilled persons was dwindling. Despite these conditions, the provincial governments were generally showing little interest in expanding facilities for technical education.

It was under these circumstances that the federal government decided to introduce legislation "to stimulate technical and vocational training and broaden its scope throughout Canada."[21]

The Technical and and Vocational Training Assistance Act, which received assent in December, 1960, was like the 1942 act in several respects. Programs were implemented through separate agreements signed by the federal government with each province, but each province signed in the case of TVTA (1960). The Act provided for the continuation of

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21 Michael Starr (Minister of Labour) in Canada, House of Commons Debates, Vol. I, (1960-61);

agreements for training projects made under the Youth Training Act (1939) or under the Vocational Training Co-ordination Act (1942). The new agreements were to run for six years, to March, 1967. There were two basic agreements: the Technical and Vocational Training Agreement; and the Apprenticeship Training Agreement.[22]

The Technical and Vocational Training Agreement included a capital expenditures program, 10 operating programs, and a correspondence course program. Under the capital expenditures program, the federal government reimbursed the provinces for 75 percent of their expenditures for approved facilities and equipment for technical or vocational training. The reimbursement of 75 percent continued until the federal contribution reached $480 for each person in the 15 to 19 age group residing in the province at the 1961 census; and thereafter at 50 percent. In the case of facilities for training the unemployed, the federal reimbursement rate was to remain at 75 percent throughout the agreement period.

The 10 operating programs provided for the federal government to contribute 50 percent of the provincial costs, except as noted below:

Program 1: Technical and Vocational High School Training, in which at least 50 percent of the school time was devoted to technical, commerical or other vocational subjects.

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22 Information on the TVTA Agreements is drawn from Donald Glendenning, op.cit.; and Annual Report, 1964-65 of the Technical and Vocational Training Branch, Canada Department of Labour (mimeographed).

Program 2: Technical Training, to alleviate the shortage of technically trained persons by providing courses of two to three years' duration emphasising mathematics and science, in order to assist professional engineers and scientists.

Program 3: Trade and Other Occupational Training Programs, for persons who needed trade-training before entering employment, but who had left the regulation secondary schools; persons who were upgrading their skills; and persons who wished to change occupations.

Program 4: Training in Co-operation with Industry, to provide for federal participation in provincial contributions to training programs which were operated by and within industry. The federal government contributed 75 percent of costs for the three following types of programs: a. Basic training in mathematics, science, and communication skills for employed workers; b. Industrial apprenticeship; c. Retraining of employees who would otherwise be displaced because of technological or other industrial changes.

Program 5: Training of the Unemployed, providing training for unemployed persons to improve their employment possibilities. The federal government contributed 75 percent of provincial training costs and 100 percent of living allowances paid to unemployed persons while under training.

Program 6: Training of the Disabled, provided training for anyone with a continuing disability who required training for employment in a suitable occupation.

Program 7: Training of Technical and Vocational Training, was designed to provide teachers for the technical training offered under other programs.

Program 8: Training for Federal Government Departments, whereby provinces agreed to provide training for federal employees, and mainly for marine engineers and other ships' officers to meet certification regulations. The federal government paid up to 100 percent of the costs of such training.

Program 9: Student Aid, was the continuation of the Dominion-Provincial Student Aid Program initiated in 1939 under the Youth Training Act. Aid was available to university students and to student nurses on the basis of academic ability and financial need. Assistance was also provided under Program 2 to technician students and under Program 7 to technical teachers-in-training.

Program 10: Manpower Requirements and Training Research. In 1965 a research program was added to encourage research projects by the provinces to provide information on technical and vocational training and manpower requirements.

Correspondence courses program: The federal government contributed 50 percent of the provincial costs for technical and vocational correspondence courses.

Apprenticeship training agreement: The apprenticeship training agreements initiated in 1944 were continued under the 1960 act. Federal contributions were 50 percent of provincial costs. All provinces signed these agreements except Quebec, where federal assistance for apprenticeship training was provided under Programs 3 and 4.

In October, 1965, Quebec opted out of Programs 1, 2, 6, 7, 9, part of Program 3, and the Correspondence Course Program. Instead of the federal contribution, the province received certain tax abatements, but only if the training programs were continued as outlined in the Technical and Vocational Training Agreement.

Federal expenditures and enrollment data for the agreements under the Technical and Vocational Training Assistance Act (1960) are presented in Tables 12 and 13.

The TVTA Act represented the largest federal involvement in education to that time. In fact, it became an even larger program than was expected or intended. The federal government had relied on provincial assessments of their manpower requirements and expected expansion of facilities under the new legislation. But, as Orlikow points out:

> ...it was the absence of accurate provincial projections that soon invalidated the initial estimates of cost. The Department of Labour had employed provincial figures in future growth -- more than doubled them to be safe -- and soon still fell far short of demand[23]

The provincial response was greater than expected when the provinces found that the federal share was to be so large, and apart from Programs 1 and 9, there were no upper limits on the federal contributions. However, some provinces were slower than others in taking advantage of these arrangements:

> The Premier of the province [of Quebec], Jean Lesage, announced to his Legislature: 'Quebec's fair share, should be proportional to its school-age population

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23 Lionel Orlikow, Dominion-Provincial Partnerships in Canadian Education 1960-67, unpublished Ph.D. dissertation, University of Chicago, 1969, p.99.

TABLE 12
FEDERAL GOVERNMENT EXPENDITURES UNDER TECHNICAL
AND VOCATIONAL TRAINING ASSISTANCE ACT
(1960, 1961 TO 1967)
(rounded to thousands of dollars)

Year	Program 1	Program 2	Program 3	Program 4	Program 5	Program 6	Program 7
1961-62	$ n a	$ 3 352	$ 1 965	$ 31	$ 3 942	$ 368	$ 213
1962-63	n a	6 794	1 930	56	7 751	749	233
1963-64	n a	7 064	2 765	88	10 492	605	381
1964-65	n a	10 239	3 575	329	13 600	655	615
1965-66	n a	3 934	2 278	629	23 979	800	429
1966-67	1 626	6 035	1 626	1 194	54 232	819	1 082
	$14 102	$37 418	$14 199	$2 327	$113 996	$3 996	$2 953
			$72 404				

Year	Program 8	Program 9	Program 10	Capital Expenditure	Apprentice Training	Correspondence Courses
1961-62	$ 27	$ 319	$ -	$ n a	$2 161	$ 9
1962-63	69	319	-	n a	2 172	42
1963-64	59	319	-	n a	2 335	1
1964-65	62	291	-	52 758	695	17
1965-66	73	319	13	n a	920	37
1966-67	114	319	114	n a	1 174	4
	$ 404	$ 1 886	$ 127	$792 242	$9 457	$100

Notes: a. Excludes expenditures for classroom training of apprentices from 1963 to 1967.
b. Includes expenditures for classroom training of apprentices.
c. In October, 1965, Quebec opted out of Programs 1,2,6,7,9, part of Program 3, and the Correspondence Courses Program. Expenditures exclude tax abatements to Quebec.
d. Except for 1964-65, amounts shown are maxima payable. Student assistance under Programs 2 and 7 are included in totals for those Programs.
e. Dept. of Labour Annual Report, 1964-65 shows $291,000 for that year.

Sources: Donald Glendenning, op.cit., and Annual Report, 1964-65 of the Technical and Vocational Training Branch, Canada Department of Labour.

TABLE 13

ENROLMENTS IN PROGRAMS UNDER TECHNICAL AND VOCATIONAL TRAINING ASSISTANCE ACT (1960), 1961 TO 1967

Year	Program 1	Program 2	Program 3	Program 4	Program 5
1961-62	n.a.	n.a.	n.a.	1 705	26 887
1962-63	119 943	11 517	n.a.	3 770	38 439
1963-64	163 890	13 887	27 394	7 814	49 047
1964-65	189 326	19 610	57 362	9 199	59 821
1965-66	214 165	21 741	60 065	20 103	80 991
1966-67	239 056	27 694	75 812	39 204	150 044

Year	Program 6	Program 7	Program 8	Program 9	Registered Apprentices
1961-62	2 765	n.a.	n.a.	n.a.	21 018
1962-63	2 968	601	397	n.a.	21 879
1963-64	2 185	749	1 243	n.a.	23 163
1964-65	3 981	1 623	1 446	24 709	26 682
1965-66	3 964	1 762	1 158	n.a.	31 827
1966-67	4 581	640	735	n.a.	37 996

Notes: a. Including apprentices in classroom training.

Source: Donald Glendenning, Review of Federal Legislation..., 1968.

> and not to the speed with which it can initiate the construction of buildings.' M. Lesage noted that in the period 1961-63 Ontarioi had had $200 million of building projects approved, whereas his province received only $28 million".[24]

The most general criticisms of the TVTA programs, however, were that some of the courses were obsolete, teachers were ill-prepared, information for planning was inadequate, there was no over-all plan for training, and that the original 10-year estimate had been exceeded by over 40 percent within 15 months.[25]

The most noted criticisms of the TVTA programs were the increased retention rates of high schools and an increase in the number of vocational schools.[26] More generally, the provinces retained control of the specific programs offered under the Act while the federal government was able to deal substantially with the manpower shortages as perceived in the early 1960s. Surprisingly little criticism of the consititutionality of the program was evident - until Quebec's opting out of some of the programs in October, 1965.

By 1966 it appeared that the federal-provincial partnership in technical training had finally succeeded in establishing a solid capacity for longer-term planned development in this field. All federal signs pointed to extensions of the TVTA programs beyond the deadline of 31 March, 1967. But at the federal-provincial conference in

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24 Ibid., p. 101.
25 Ibid., p. 103-104.
26 Ibid., p . 105.

late October, 1966, the Prime Minister (Lester Pearson) announced that the TVTA Act would not be renewed but would be replaced by a new program under the Adult Occupational Training Act.

Some of the provinces that had developed their technical training programs more slowly were understandably concerned that the TVTA programs should be terminated so quickly and protested vigorously. The federal government consented to a "phasing-out" stage with the following provisions.

1) Each province would receive 75 percent of $480 per capita in the 15-19 year age group (1961 census) until March 31, 1973, and then 50 percent on a further $320 per capita indefinitely.

2) Operating grants for post-secondary institutions were brought under the Federal-Provincial Fiscal Arrangements Act (1967) whereby the federal government would provide 50 per cent of operating costs or $15 per capita.

3) Students enrolled in Programs 2 to 8 as of April 1, 1967, would be supported by the former federal share until the end of their courses; Program 10 was brought under the new legislation; and Programs 1 and 9 were discontinued on March 31, 1967.[27]

GRANTS TO UNIVERSITIES AND COLLEGES

What were apparently the first federal government grants towards the operating expenditures of higher education

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27 Ibid., pp. 162-163.

were made under the terms of the Agricultural Instruction Act of 1913. Under this Act federal funds not exceeding $20,000 were disbursed among the veterinary colleges based on student enrolment in each college.

Apart from this isolated case of grants to veterinary colleges, there is no evidence of federal government grants to universities until the 1940s. On the other hand, there was little concerted effort by the universities to seek federal aid.

Veterans Rehabilitation Act

The federal government passed the Veterans Rehabilitation Act in 1945. This included provision for direct grants to the universities.

The government anticipated an enrollment of 30,000 to 35,000 men and 5000 women who had been in the war. This represented a doubling of the 1939 enrollment in Canadian universities. (The majority of these veterans were expected to enroll in business administration and commerce courses, followed by engineering, arts and medicine.) Since student fees at the time covered about 40 percent of the universities' operating costs, a doubling of enrollment would lead to a sharp increase in costs not covered by fees.

The Veterans Rehabilitation Act received royal assent on December 18, 1945. The NCCU request for direct federal assistance to the universities was granted (at the rate of $150 per veteran per year) and was paid, beginning in the 1945-46 academic year, under the authority of section II of the Act which permitted the federal government to make such grants to any university school or similar institution. These direct grants to universities continued from 1945-46 to

1951-52 when the federal government instituted the program of per capita grants described in the next section. The payments made to veteran-students and to the institutions are shown in Table 14.

An Order-in-Council in 1948 provided for a supplementary grant to the universities not exceeding $250 per veteran per year in 1947, 1948, 1949 and 1950, where the expenses incurred by a university in the training of veterans exceeded the fees paid on their behalf.[28]

The Veterans Rehabilitation Act is generally considered to have been a highly successful undertaking. The scheme marked the first time since 1913 that the federal government undertook a direct financial involvement with universities. In the peak enrolment year under the Act (1946-47) student population in Canadian universities doubled.

Operating Grants to Universities

The 1951 Appropriation Act included vote 690 which provided for federal government grants totalling $7,100,000 to be made directly to Canadian universities. The direct antecedent of this program was the veterans assistance program of 1945-51, but full appreciation of the origins of the new program requires a review of the late 1930s and the 1940s.

Canadian universities had been dependent on endowment income for a large portion (about 20 to 40 percent) of their

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28 Department of Veterans Affairs, Annual Report, 1946-47, (Ottawa, 1948) p. 20.

TABLE 14

ALLOCATIONS TO STUDENT-VETERANS
AND TO INSTITUTIONS, VETERANS REHABILITATION ACT

Year	Tuition and Fees	Grant to Institution
1944-45	429 937.00	
1945-46	12 104 955.00	2 922 617.14
1946-47	32 954 893.00	4 219 486.89
1947-48	26 913 307.00	4 285 177.75
1948-49	21 498 556.00	3 182 822.15
1949-50	14 782 477.00	1 975 234.41
1950-51	8 188 340.00	956 783.00
1951-52	3 720 258.00	30 457.00
1952-53	1 585 309.00	
1953-54	685 487.00	
1954-55	357 446.00	
1955-56	187 329.00	
1956-57	122 674.00	
1957-58	82 919.00	
1958-59	78 921.00	
1959-60	52 523.00	

Source: LeSieur, Antonio. Facteurs militaires qui ont amenés le gouvernment fédéral à aider le financement des institutions d'enseignement supérieur au Canada. Université d'Ottawa, 1961, p. 89, reproduced in Lucien Michaud, "Government Policies of Financial Support of Church-related Colleges and Universities in Canada," unpublished Ph.D. thesis, Columbia University, 1979, p.80.

operating expenditures, but declining personal and corporate incomes in the 1930s reduced annual gifts and bequests. Provincial government grants also declined in the 1930s. Universities met this financial difficulty by increasing their tuition fees. "Thirty years ago [1909] a student paid about 20 percent of the relatively low cost of his education [fees in Arts were $30 to $60]; today he is paying from 40 percent to 50 percent of much higher costs."[29]

This combination of financial forces gave rise to numerous requests across the country for provincial and, more often, federal assistance to students and the universities. The focus for these requests was the Royal Commission on Dominion-Provincial Relations (the Rowell-Sirois Commission) appointed in 1939. The Report of the Rowell-Sirois Commission acknowledged that the commission had received many briefs asking for federal financial aid to students and educational institutions, but it also noted that these requests arose largely from a concern that provincial governments had been forced to reduce their educational expenditure during the depression.[30] While the commission expressed sympathy for these views, it added "...the representations appear to us to go too far in denying the right of each province to decide the relative importance of expenditures on education and expenditure on the competing services."[31]

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29 W.E. McNeill, "The Increasing Cost of Education", in Proceedings of the National Conference of Canadian Universities, 1939, p. 13.

30 Report of the Royal Commission on Dominion-Provincial Relations, Book II, (Ottawa: Kings Printer, 1940), p. 50

31 Ibid.

The commission instead proposed to find the financial means whereby each province could meet its obligations to education along with other responsibilities. "Hence, we do not think that it would be wise or appropriate for the Dominion to make grants to the provinces ear-marked for the support of general education." But the commission was willing to distinguish "general education" from "certain phases of education which are believed to be of peculiar national importance" - specifically in the field of university education. However, because the commissioners had close connections with Canadian universities, they said they were "refraining from making a recommendation on this subject."[32]

Nevertheless the commission proceeded to grant cautious approval to federal aid to universities. On the argument that "efficient functioning" of universities in all the provinces was essential to regional "equality of influence in the national life," it was anticipating that the provinces might welcome some federal assistance. "If this is the case, a relatively small Dominion annual grant divided among the provinces in rough proportion to their population for the benefit of institutions which receive help from the state might play a peculiarly useful part in our national life."[33]

World War II diverted attention from the Rowell-Sirois grant proposal, and then the Veterans Rehabilitation Act provided temporary financial relief for universities.

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32 Ibid., pp. 51-52

33 Ibid., p. 52.

A committee of the National Conference of Canadian Universities presented a statement to the Prime Minister (Louis St. Laurent) and the Minister of Finance (Douglas Abbott) in March 1949. This statement explained that Canadian universities had recently faced serious deficits, could not afford the necessary expansion of physical facilities, and feared that educational opportunities were going to be restricted rather than expanded. Justification for federal government involvement was in terms of the professional manpower - engineers, scientists, doctors, dentists - required in the national interest. Furthermore, students were required to go to other provinces for some special professional programs.[34] A similar brief was presented to the Royal Commission on National Development in the Arts, Letters and Sciences (Massey Commission) which had been appointed earlier that year. The Report of the Massey Commission was tabled in the House of Commons on June 1, 1951.[35]

The recommendation of the Massey Commission was as follows:

a) ...the Federal Government make annual contributions to support the work of the universities on the basis of the population of each of the provinces of Canada.
b) That these contributions be made after consultation with the government and universities of each province, to be distributed to each university proportionately to the student enrollment.
c) That all members of the national Conference of Canadian Universities be eligible for the federal grants mentioned above.[36]

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34 "The Financial Problems of Canadian Universities", Finance Committee, National Conference of Canadian Universities, March 1, 1949, (mimeographed).

35 Report of the Royal Commission on National Development in the Arts, Letters and Science, (Ottawa: King's Printer, 1951).

36 Ibid., p. 355.

The federal government acted quickly in response to the commission's recommendation of financial aid to universities. The Prime Minister (Louis St. Laurent) announced on June 19, 1951, shortly after the report was tabled, that:

> The government has...reached the conclusion that it is in the national interest to take immediate action to assist the universities to perform functions which are quite essential to the country, and indeed to the proper administration of the government. ...we have decided that grants should be made available for the forthcoming academic year along lines recommended by the Massey Commission.[37]

The Prime Minister added that the government was not ready to ask Parliament to accept a permanent scheme of grants to universities, but that the Massey Commission recommendations would be followed for the forthcoming year. Moreover, the total sum would be "approximately equal to fifty cents per capita of the present estimated population of the country."[38] It is not apparent where the amount of fifty cents originated, but one possibility is that since the NCCU brief requested $7,842,000, the government had taken the round figure of fifty cents which when multiplied by the national population at the time provided a sum of $7,100,000 - an amount just suitably below the sum requested by the NCCU.

St. Laurent added that this aid was to be considered a supplement to and not a replacement of provincial grants. It was designed to enable the universities to maintain present

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37 Canada, House of Commons Debates, 4th Session, 21st Parliament, Vol. V. (1951): 4278.

38 Ibid.

resources. St. Laurent said:

> The federal grants are designed, moreover, primarily to assist the universities to maintain the highly qualified staffs and the working conditions which are essential for the proper performance of their functions - in other words, to maintain quality rather than to increase existing facilities.[39]

The per capita grants program introduced in 1951 was continued in 1952-53 by the Appropriation Act, Vote 699, at fifty cents per capita distributed according to the provincial population. This time, and for the duration of his life, Duplessis refused to allow the universities in Quebec to accept the grants. Perhaps it is more appropriate to say that the universities were "advised" to reject the grant with the implied threat that provincial grants would be withheld. The universities complied; their share of the federal grant reverted to the government's Consolidated General Revenue Fund. Quebec turned to the personal income tax to support its universities, a move that was particularly accommodated by an extension of the federal tax credit available to Quebec residents.

Criticism of the program was developing elsewhere but not on constitutional grounds. The President of Dalhousie University noted that the grants formula resulted in a different per-student rate in each province and that Nova Scotia, with $92 per student, stood at the bottom of the list.[40] Moreover, the maritime universities received little provincial support. In 1953-54 the per capita grants program continueed at fifty cents under the Appropriation Act, Vote 121. However, the terms were modified to permit grants being made directly to institutions affiliated with the eligible universities, which enabled several theological colleges and seminaries to receive grants.

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39 Ibid.

40 National Conference of Canadian Universities, Proceedings, 1953, p. 79.

This program was continued under the Appropriation Act by annual votes, on the basis of fifty cents per capita provincial population, for 1954-55 and 1955-56. The amount was increased to $1.00 in 1957 following a nationwide campaign by the universities.

In a preliminary report in 1956, the Gordon Commission on Canada's Economic Prospects gave unqualified support to the general requests of the universities. This report stated that:

> What is being suggested in essence is that a deliberate and sustained effort be made to raise the quality and standards of Canadian universities to among the highest prevailing anywhere in the world. It is perhaps not going too far to suggest that no other single course of action would be so likely to have such an important and fundamental effect upon the long-term economic prospects for Canada.[41]

On January 29, 1957, the Prime Minister introduced a motion to increase the per capita grants to $1.00, under vote 132 of the of the Appropriation Act No. 6 (1956), and to distribute the funds through the NCCU. The Motion read:

> To authorize payments to the national conference of Canadian universities (hereinafter called 'the conference') for the purpose of making grants to institutions of higher learning in accordance with an agreement entered into or to be entered into with the approval of the governor in council, between the Minister of Finance and the conference, such agreement to include inter alia, provision that the total amount of grants to all the institutions of higher learning in

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41 Royal Comission on Canada's Economic Prospects, Preliminary Report, (Ottawa: Queen's Printer, 1956).

> any one province be calculated by multiplying the population of the province by $1, and that any amount payable to an institution of higher learning and not paid by the conference in the present fiscal year may be retained by the conference until such time as the institution to which the money is payable claims the payment from the conference or parliament provides otherwise for the disposal thereof; ...additional amount required, $7,986,000.[42]

St. Laurent set aside the matter of the constitution by saying:

> I believe that the Canadian government has the constitutional right to offer assistance to universities and that it is its duty and responsibility to do so.[43]

Further to this constitutional question, he said that the grants would be turned over to the NCCU for payment to the universities because:

> I...hope that ultimately it will convince the people who require university services throughout the whole of Canada that there is no intention and no possibility of this impinging upon the exclusive legislative jurisdiction of the respective provinces...[44]

He said the grants would not be turned over to the provincial governments because:

> ...the provincial governments have a great many calls upon their finances, and these grants are recommended to parliament so they may go to the universities and to no other quarter; and we think that by placing them in the hands of the national conference of Canadian universities they will go to those universities.[45]

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42 Canada, House of Commons Debates, vol.I, (1957):752.

43 Ibid., 753.

44 Ibid.

45 Ibid., p. 781.

But Duplessis remained firm in his refusal to allow Quebec universities to accept the grants. The Globe and Mail reported that:

> The Premier [Duplessis] has hinted that any university accepting federal aid would lose provincial grants what he described as larger than those planned by Ottawa.[46]

Only two Quebec colleges accepted the federal grants from the NCCU. These were the Presbyterian College of Montreal and Collège Marie de France, an affiliate of the University of Paris. Neither of these colleges had received provincial funds in any case.[47]

In the fall of 1958, under the Conservative government, the grant was raised to $1.50 per capita provincial population. The NCCU was incorporated in the form of the Canadian Universities Foundation (CUF) to act as the recipient of federal funds and the agent for distributing these funds to the eligible universities.

The federal government continued the per capita grant at $1.50 in 1959-60. At that time there was increasing concern that these grants were not being accepted by the universities in Quebec. As the pressure of university costs led to pressure on the Quebec government to relent on its position in this matter, Premier Duplessis expressed serious interest in devising a solution to this situation. But Duplessis died in 1959, before the matter could be settled. His successor, Paul Sauvé, announced four education bills in Quebec to increase provincial support to universities. Sauvé died in January 1960, and his proposed education legislation was introduced by the new premier, M. Barrette. These acts,

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46 Globe and Mail, Toronto, December 20, 1956.

47 National Conference of Canadian Universities, Proceedings, 1959, p.104.

assented to in March 1960, provided for provincial guarantees of universities' borrowing for construction purposes but also authorized the universities to claim amounts held in trust for them by the Canadian Universities Foundation and amounts earmarked for them by the Canada Council, on condition that these funds be deposited in the province's sinking fund. The universities immediately claimed, and turned over to the province, approximately $25 million from the CUF fund.

At the same time, a second act provided that the province would pay an annual grant to the universities equal to $1.75 per capita, to be distributed among the universities on the basis of enrolment. A third act provided for an increase of one percent in the corporation tax and a tax of one percent on trust companies' net revenues, such tax revenues to be paid into the province's education fund to meet the cost of the new per capita grants. A fourth act provided for provincial subsidies to the collèges classiques and other educational institutions.[48]

Within a few days of the Quebec Education Act's receiving royal assent, the federal Minister of Finance (Donald Flemming) introduced a resolution in the House of Commons:

> That it is expedient to introduce a measure to amend the Federal-Provincial Tax-Sharing Arrangements Act to provide certain alternative arrangements for payment, either by Canada through the Canadian Universities Foundation or directly by a province, of the grants to institutions of higher learning presently paid under the authority of the Appropriation Act; and also to extend for a further period of two years the rate of 13 percent for standard individual income tax for the purpose of

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48 E.F. Sheffield, "Funds for Universities and Colleges in Quebec", draft mimeograph, March 18, 1960, AICC file no. 1948.

> of calculating the tax equalization payments to the provinces and the amounts payable to the provinces under the tax rental agreements.[49]

The first amendment to the resolution involved no additional cost to the federal or provincial governments but simply provided the alternative arrangements for university grants described above with respect to Quebec. Moreover, this amendment put the grants on a continuing basis rather than requiring annual approval under the Appropriation Act.

The amendment provided that:

> When any province which collects its own corporation tax chooses to pay additional grants to its institutions of higher learning on the basis of student enrollment on a scale equivalent to $1.50 per capita of its population, its corporate taxpayers will receive an additional abatement of 1 percent under the Income Tax Act, raising that abatement from 9 to 10 percent. This option will be available for the taxation years 1960 to 1961 provided a province requests amendment of its agreement with respect to the taxation year 1960 by April 30, 1960, and with the respect to the taxation year 1961 by December 31, 1960.[50]

Provinces that had rented taxation of corporations to the federal government would be required to resume collection of their own corporate taxes. The difference between the value of $1.50 per capita and 1 percent corporate tax revenues in each province would be paid to or by the federal government to maintain the $1.50 level.

When the debate on this resolution resumed on April 1, 1960, some Quebec M.P.s objected to the proposed amendments on constitutional grounds, arguing that the proposed

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49 Canada, House of Commons Debates, vol. II, (1960): 2223.

50 Ibid., p. 2228

amendment was simply a different method for providing federal assistance to education.[51] Nevertheless, the amendment passed and received royal assent on May 27, 1960.

In January 1962, the federal government announced an increase in the per capita grant from $1.50 to $2 effective in 1962-63. The required act to amend the Federal-Provincial Tax-Sharing Arrangements Act received royal assent on December 20, 1962.

A CUF Commission on Financing Higher Education in Canada was appointed in February 1964, with V.W. Bladen as chairman. The Bladen Commission presented its Report on June 30, 1965. It suggested:

> That the Federal Government initiate annual discussions with the Provincial Governments to review the adequacy of the federal contribution to the costs of higher education; but the federal support be in a form which avoids any invasion of the provincial right, and obligation, to direct and control such education.[52]

More specifically, the commission recommended that the per capita grant be raised to $5 for 1965-66 and be increased by $1 each year thereafter until the discussions with the province would "lead to an appropriate revision of the amount of the grants." An important innovation was the recommendation that the grants be distributed among the universities within a province according to a formula of weighted enrollments. The $5 per capita grant was estimated to provide approximately 30 percent of the operating expenditures exclusive of research.[53]

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51 Ibid., April 26, 1960, p. 3281.

52 Commission on the Financing of Higher Education in Canada, Report (Ottawa: AUCC, 1965), p. 67.

53 Ibid., p. 73.

The commission also recommended that a Capital Grants Fund be established through a federal contribution of $5 per capita per year; that funds for research grants allocated by the federal research councils be increased to a total of $75 million for 1966-67, and that research grants carry a 30 percent supplement for overhead costs; that "a general sustaining grant for research" be paid to each university equal to 10 percent of the aggregate academic salaries; and that the Canada Student Loans Plan be continued. Further recommendations were made concerning tax relief, provincial university grants commissions, and student aid programs.[54]

On January 20, 1966, the Prime Minister (Lester Pearson) announced that the per capita grant would be increased from $2 to $5, effective in 1966-67. Federal action on the Bladen Commission recommendations for a capital fund and the size of the per capita grant in future years was to be delayed pending the federal-provincial conference scheduled for the autumn of 1966.

Responsibility for co-ordination of federal assistance to higher education was assigned to the Department of the Secretary of State in June 1966.

The per capita grant for 1966-67 was distributed using a formula significantly different from that employed in previous years. The total grant of nearly $100 million (an increase of $60 million from 1965-66) did average $5 per capita depending on the proportion of out-of-province students enrolled in each province. The distribution among universities within a province also varied according to the "mix" of students enrolled in different programs.

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54 Ibid., pp. 59-61.

But before there could be proper assessment of the effects of the revised per capita formula, the per capita grant program was terminated. At a federal-provincial conference held at Ottawa, October 24 to 28, 1966, the federal government announced a new formula for federal assistance to education, to be embodied in the Federal-Provincial Fiscal Arrangements act of 1967.[55] The federal government withdrew its direct support for operating costs of universities and introduced a scheme whereby four percentage points of personal income tax and one percentage point of corporate income tax would be transferred to the provinces. In addition an adjustment would be made to bring the total transfer up to the greater of $15 per capita provincial population or 50 percent of the operating expenditures of post-secondary education institutions in each province.

Total per capita grants to universities are shown in Table 15.

FINANCIAL ASSISTANCE FOR STUDENTS

The first federal government assistance given directly to individuals for education or training evolved from the federal program of assistance for World War I veterans. In November 1918, the federal government authorized the granting of loans to a maximum of $500 to disabled veterans in need of assistance to pursue a course of study interrupted by war service. These loans were repayable within 5 years. Later

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55 Statutes of Canada, 1966-67, C.89. Received royal assent on March 23, 1967.

TABLE 15

PER CAPITA UNIVERSITY GRANTS, 1951-2 TO 1966-7 BY PROVINCE

(Thousands of Dollars)

Year	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total
1951/52	181	49	321	258	2 028	2 299	388	416	470	583	6 993
1952/53	187	52	327	263	-	2 383	399	422	485	599	5 117
1953/54	192	53	332	268	-	2 449	405	431	501	615	5 246
1954/55	199	53	337	274	-	2 523	414	439	520	633	5 392
1955/56	206	54	342	279	-	2 592	425	445	533	653	5 529
1956/57	415	99	695	555	4 628	5 405	850	881	1 123	1 398	16 049
1957/58	426	99	702	565	4 758	5 622	860	879	1 160	1 487	16 558
1958/59	657	150	1 065	866	7 326	8 705	1 305	1 332	1 802	2 316	25 524
1959/60	673	153	1 074	885	7 499	8 928	1 327	1 353	1 865	2 355	26 112
1960/61	688	154	1 084	900	a	9 134	1 349	1 365	1 925	2 409	19 008
1961/62	672	158	1 114	881	7 889	9 325	1 395	1 397	2 009	2 409	27 249
1962/63	940	212	1 492	1 214	10 732	12 684	1 870	1 860	2 740	3 318	37 062
1963/64	962	214	1 512	1 228	10 936	12 896	1 900	1 866	2 810	3 390	37 714
1964/65	982	214	1 520	1 234	11 124	13 172	1 916	1 886	2 864	3 476	38 388
1965/66	996	216	1 522	1 246	11 314	13 462	1 924	1 902	2 902	3 578	39 062
1966/67	2 200	558	4 642	3 704	27 681	33 837	4 960	4 482	7 065	9 440	98 615
	10 576	2 488	18 081	14 620	105 915	145 412	21 687	21 356	30 774	38 659	409 568

a. 1% corporation tax abatement and net value of abatement from this year on.

SOURCES: Statistics Summary of Federal Contributions to the Provinces and Certain Payments to Institutions and Individuals in the Provinces for the fiscal years 1949-50 to 1959-60. (Dept. of Finance, June 30, 1961), p. 2.

Statistics and Notes on major Federal Transfers and Selected Loans to the Provinces Municipalities and Provincial and Muncipal Institutions and Authorities, (1961-62 to 1967-68), (Dept. of Finance, Federal-Provincial Relations Division, October 1968), Section B.

this was extended to all veterans, but only if they had begun a course of study before the war.[56]

The Conference of Canadian Universities had urged the federal government to provide financial assistance to returning World War I veterans enrolling in universities. But the government was adamant; it would assist in the rehabilitation only of those who were disabled, and later, those who had enlisted "under age" and thus had no vocational preparation. The university presidents, and others, continued to seek federal government bursaries and scholarships for their students, but not in the concerted fashion of 1916 to 1919.

State scholarships

Towards the latter part of the 1930s, however, there was renewed interest in government aid to students. In 1937, Paul Martin introduced in the House of Commons a resolution calling for a system of national scholarships. Martin stated there were two objectives and equality of opportunity.[57] The motion was never put to a vote and the government indicated that it was unwilling to undertake such an extensive system of scholarships.

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56 Robin Harris, A History of Higher Education in Canada, 1663-1960 (Toronto: University of Toronto Press, 1976).

57 Canada, House of Commons Debates vol.II, (1937):1189-90.

Dominion-provincial student aid program

Two years after Martin's proposal, the government introduced the Dominion-Provincial Student Aid Program under the Youth Training Act (1939). Under this Act, the federal government could not inaugurate projects on its own initiative, although it did, from time to time, suggest projects that seemed desirable.[58] It was in this context that the federal government had proposed a new project which it described simply as "student aid":

> Student aid, a project to assist young people of proven academic merit, who were in financial need, to enter upon or to complete a course of training leading to a degree in a university. Maximum assistance to any individual was not to exceed $200 for the academic year.[59]

The proposal was agreed to by British Columbia, Saskatchewan, Alberta, Manitoba and Prince Edward Island in 1939. Quebec joined in 1940, Nova Scotia and New Brunswick entered in 1942, Ontario in 1944, and Newfoundland joined soon after entering confederation in 1949. The Dominion-Provincial Student Aid Program was brought under the Vocational Training Co-ordination Act in 1942 when that Act replaced the Youth Training Act of 1939.

Under the terms of these acts, the federal government could make payments to the provinces equal to 50 percent of the allowable expenditure incurred for the Student Aid Program. The funds were used mainly to assist students in engineering, science, medicine, and dentistry. These courses

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58 "Report of the Department of Labour", in Departmental Reports, vol.IV, 1939-40, p.101.

59 Ibid, p.102. Apparently the maximum assistance per student was raised from $150 to $200 between the announcement of the proposal and its implementation in the 1939-40 academic year.

received priority due to the manpower required for the war effort; students were required to sign an agreement that they would make their services available for this purpose. Assistance took the form of a grant or loan or combination thereof, according to provincial programs.

A special Dominion Fund of $400,000 was obtained from the War Appropriation to provide for students who were ineligible under the joint Dominion-Provincial schedules and for students residing in a province which had not joined the federal government in this program. This fund provided loans to students in engineering, science, medicine, and dentistry.

Part of the $400,000 appropriation was used for direct grants to universities to meet the additional costs of an accelerated program in the faculties of medicine and dentistry. The universities had been requested to do this, by shortening the summer vacation period, in order to increase the output of doctors and dentists for war service.[60]

Robert Pike offers an assessment of the Student Aid Program:

> It is difficult to judge the degree to which the Dominion-Provincial Aid Program succeeded in promoting equality of educational opportunity. It was probably just "a drop in the bucket" of need, although its existence may have influenced some of the provinces to establish their own separate aid programs. Federal expenditure on the program amounted to less than 45 million during the twenty-five years of its existence

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60 "Report of the Department of Labour", in Departmental Reports, vol. III, 1942-43, p.30.

> [1939-1964] and only a sprinkling of students (on average less than 3,000 a year) received financial support.[61]

In spite of the Student Aid Program, there continued to be strong representations for a system of national scholarships or bursaries. Many such proposals were made to the Rowell-Sirois Commission.

The Rowell-Sirois Commission was reluctant to recommend federal support for higher education because the commission sought to emphasize provincial responsibility for education. However, it could not refrain from recommending a small federal grant to the provinces for the use of state-supported educational institutions. It was the expressed hope of the commission that if such a grant were made that it would be used "to provide scholarships and bursaries which would bring its [universities'] opportunities within the reach of poor but able students."[62]

Much of the concern for student financial aid during the period 1940 to 1945 was directed to assuring that proper provision would be made for returned soldiers who wished to continue their education.

Grants to returned servicemen

Soon after the start of World War II, the federal government set up advisory committees on demobilization and

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61 Robert Pike, Who Doesn't Get to University...And Why (Ottawa: Association of Universities and Colleges of Canada, 1970), p.133.

62 Royal Commission on Dominion-Provincial Relations, Report (Ottawa: King's Printer, 1940), p.51.

rehabilitation. In 1941 an order-in-council was issued providing extensive educational benefits for veterans. There was initial scepticism among veterans because previously "no state had so unreservedly opened the doors to prolonged professional training." Land settlement had been the favoured scheme for demobilization.

The Order-in-Council provided that:

> In case any discharged person
> (a) Has been regularly admitted to a university before his discharge, or is regularly admitted to a university either within
> (i) one year from his discharge, or
> (ii) one year from the commencement of the university year, or of the course which he is pursuing, next following his discharge, if such discharge precedes such commencement by not more than three months;
> (b) Resumes a course, academic or professional interrupted by his service or commences any such course, in such university, within one year and three months after his discharge or within such longer period as may be necessary to enable him to complete his university matriculation or as may arise on account of his ill-health or on account of other good cause shown to the satisfaction of the Minister, the Minister may, subject to the provisions of paragraph 10 hereof order that he be paid a grant for any week or part thereof during which he pursues such course, at a rate not exceeding $13.00 per week if he is a married person and $9.00 per week if he is not a married person, diminished by such amount, on account of any pension, wages, salary, or other income such person may have received or be entitled to receive in respect of such period, as to the Minister seems right, but the grant shall not be continued to any such person who fails in more than two classes or subjects in any academic year, nor to any such person who having failed in either one or two classes or subjects also fails in either or both supplementary examinations next offered by the university in such classes or subjects.[63]

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63 H.F. McDonald, "The Re-establishment of Ex-Service Men, "Proceedings of the National Conference of Canadian Universities, June 9-11, 1942 p.78. By June, 1944, the maintenance allowance had been increased to $60 a month for single men and up to $138 a month for a man with a wife and children.

In addition to these grants to undergraduates, the order-in-council also provided for grants for post-graduate courses in cases where these had been interrupted by war service, or not commenced prior to service, or even after completion of an undergraduate course under the veterans' program. But eligibility for post-graduate grants depended n the student's academic record, the type of course intended and "its desirability in the public interest."[64]

The amount of the direct grants mentioned above were in conformation with the out-of-work benefits provided for all ex-servicemen and were comparable to the benefits paid in the higher brackets under the Unemployment Insurance Act.[65] In addition to these maintenance grants, the federal government paid tuition and other obligatory fees.

The benefits were to be extended for a period equal to the time the person had been in the armed services. Moreover, they were for the academic year only; veterans were required to find other funds or employment for summer maintenance.

For the purposes of these benefits, a veteran was defined as:

> a person who has been on active service in the Canadian forces or in receipt of active service rates of pay from such forces during the war, including a person who has served in the Canadian Women's Army Corps since the 13th day of August, 1941 and (ii) a person domiciled in Canada who serviced in the forces of His Majesty other than Canadian forces and was so domiciled at the time he joined any such forces for the purpose of the war, and who has been discharged from such forces.[66]

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64 Ibid.

65 Ibid, p.79.

66 Veterans Rehabilitation Act, Consolidation, 1959, p.2.

Benefits were also available to veterans who enrolled in vocational training courses "likely to fit him for employment or re-employment or to enable him to obtain better or more suitable employment."[67]

The veterans' benefits program was initially administered as the Re-establishment Training Agreement under the Vocational Training Coordination Act of 1942, but on May 3, 1945, new legislation was introduced to provide for a separate Veterans Rehabilitation Act.

National scholarship plan

In the 1958 federal election campaign, the liberal leader (Lester Pearson) proposed a program of 10,000 national scholarships and bursaries.[68] Apparently the Prime Minister (John Diefenbaker) had made a similar proposal since the NFCUS brief of March 1959, addressed to the Prime Minister reminds him that "last year [1958] you promised that we would be informed within a reasonable delay of the decision of the Federal government regarding the proposed national programme of scholarships."[69] Meanwhile the NFCUS had modified the earlier scholarship recommendation and now asked for 10,000 scholarships for first and second class honours students, at a minimum value of $750 for students living in a university city and $1000 for students coming from other centres. (The cost of university attendance for one year in 1956 was said to have averaged $1200). It was

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67 Ibid.

68 Globe and Mail, Toronto, 15 February, 1958.

69 National Federation of Canadian University Students, "Brief on Government Aid to Higher Education," March 5, 1959, p.5.

also proposed that the federal contribution to the Dominion-Provincial Student Aid Program be increased from $200 thousand to $2 million.

A similar proposal was made in February 1961, this time under the title of "The National Bursary Plan" in a brief to federal and provincial governments from the NFCUS. The brief proposed:

> ...that a National Bursary Plan be adopted and financed soley by the Government of Canada, with the co-operation of the provincial governments. The plan is designed to provide bursaries of a maximum of $600 each for 10,000 new students every year...[and] the final number of bursaries to be awarded annually is expected to be 40,000 four years after the plan's inception.[70]

The brief emphasized on one hand the existing shortages of highly trained manpower, and on the other hand the "waste" of talent due to the low percentage of the college-age group enrolled in universities. Although the exclusive responsibility of the provinces for education was underlined, the appeal for bursaries was based on the assertion that these "are simply a form of direct individual assistance to the citizens of Canada, of the same nature as assistance to the unemployed and of equal urgency."[71] The brief also quoted the Massey Commission's view that direct educational assistance to individuals did not interfere with education, and continued by citing the precedent of the Dominion-Provincial Student Aid Program. Moreover, it was argued, the equal educational opportunity due every Canadian young person

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70 National Federation of Canadian University Students, "The National Bursary Plan," February 1961, p.3.

71 Ibid, p.7.

should not be constrained by the unequal financial ability of the different provinces. Finally, attention was drawn to the high level of inter-provincial mobility of students. Federal payments for the Student Aid Program appear in Table 16.

Canada student loans plan

During the 1963 federal election the Liberal platform repeated the earlier proposal for 10,000 national scholarships, valued at $1000 each for each year of a four-year honours program at university. But the Throne Speech of February 18, 1964, referred instead to a student loan scheme. This was mentioned again by the Finance Minister (Walter Gordon) in his budget speech of March 16.

When the Bill C-110, "Measure to Facilitate Making of Loans to Students," was introduced for second reading on July 14, 1964, the Minister of Finance noted that the rapid expansion in university enrolment "would greatly overstrain existing arrangements for student financing."[72] Moreover, the same increase in post-secondary students would make it unusually difficult to obtain summer jobs.

The major opposition speakers agreed that the loan scheme would offer some assistance to university students, but severly critized the government for reneging on its promise of 10,000 scholarships. Some Quebec M.P.s went further and attacked the constitutionality of the plan.

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72 Canada, House of Commons Debates, vol.V, (1964): 5442.

TABLE 16

FEDERAL GOVERNMENT PAYMENTS AND RECIPIENTS
UNDER THE DOMINION-PROVINCIAL STUDENT AID PROGRAMS,
1939 TO 1959, BY PROVINCE

Province	Federal Payments 1939-1959 ($ thousands)	Student Recipients 1939-1959
Newfoundland	76	384
Prince Edward Island	70	653
Nova Scotia	140	1 244
New Brunswick	214	2 264
Quebec	1 041	16 244
Ontario	1 093	12 403
Manitoba	82	1 018
Saskatchewan	399	3 660
Alberta	194	2 468
British Columbia	476	7 302
Total	3 786	47 460*

* includes 5 596 nursing students

Source: Rosemary Bushnell, "Provincial Student Aid Programs for Higher Education," (mimeographed, Canadian Universities Foundation, 1959), Appendix B.

On July 28, 1964, the Canada Student Loans Act received royal assent. The Act authorized the federal government to guarantee loans made by banks to eligible students to a total of $40 million for 1964-65. Full-time post-secondary students who were Canadian citizens or residents would be able to borrow up to $1000 a year to a total of $5000. The federal government would pay the interest while the student was enrolled and for 6 months thereafter. Interest would then be charged at 5 3/4 percent per annum.[73] Repayment was to be made within 10 years. The total loanable sum was to be allocated among the provinces in proportion to their populations ages 18 to 24; the loanable allotments would be increased each year in proportion to the increase of this age group.

The province of Quebec opted out of the loan plan and received compensation based on the total operating cost of the plan and the relative size of its 18 to 24 year age group.

Students immediately took full advantage of the plan to the extent that in November 1964, the allocation for Ontario, Nova Scotia and Prince Edward Island had to be increased by a total of $3,230,000. During the first year of operation, 41,571 students borrowed an average of $775 each. In 1965 a means test was introduced for loan eligibility, and in 1966 the federal government passed responsibility for the administration of the plan to the provinces.

In June 1966, the Prime Minister (Lester Pearson) reaffirmed his 1965 election promise that a $10 million per year program of university busaries and scholarships would be

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73 The interest rate was allowed to float after August 1968.

put into effect for 1966-67. But the Minister of Finance (Mitchell Sharp) later announced that the program was among those being deferred as part of the government's policy of slowing down the increase in government spending.[74]

Tax exemptions

The NCCU finance committee on 21 February 1953 resolved to express their appreciation to the federal government for the announcement in a recent budget that allowed an income tax deduction of $400 a year in the case of children over 21 who were attending university and proceeding towards a degree or diploma. The committee remarked in their resolution that "This action represents an excellent investment in the most promising and deserving youth of Canada who through University work will be equipped for roles of leadership in the Canada of tomorrow."[75]

Research Councils

National Research Council

The National Research Council arose from the pragmatic concerns of the First World War and early industrial development. The origin of the NRC has been linked to the creation in Great Britain in 1915 of a Privy Council Committee for Scientific and Industrial Research to "organize and develop the scientific resources of the country

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74 The National Finances, 1967-68 (Toronto: Canadian Tax Foundation, 1967), p.196.

75 "Report of the Finance Committee," in National Conference of Canadian Universities, Proceedings, 1953, p.65.

as an aid in solving the scientific problems presented by the war and as a preparation for meeting the problems that would be presented after the war." At the time, each of the Dominions was asked to consider the establishment of a similar organization.[76]

In 1916, the Canadian government appointed a subcommittee of the Privy Council to have charge of "all measures designed to foster the scientific development of the industries of Canada so as to place the country in a better position to supply its needs and to develop its foreign trade." This subcommittee appointed an Advisory Council for Scientific and Industrial Research which was given legislative status in 1917 by the Research Council Act, and was henceforth known as the National Research Council.

The council was to coordinate scientific and industrial research in Canada and to study Canada's unused resources, wastes, and by-products for improved use; and "to study the ways and means by which the present small number of competent and trained research men can be added to from the students and graduates of science in our universities and colleges."[77]

The council set up a system of bursaries, studentships and fellowships which remained basically the same until the regulations were changed in 1968-69. These awards included:

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76 Miller, National Government and Education., 1940 p. 466 ff.

77 Report of the Administrative Chairman of the Honorary Advisory Council for Scientific and Industrial Research of Canada, 1918, p.8.

a) Busaries: Awarded to applicants with no previous research experience, for one year, tenable at Canadian universities, not renewable.

b) Studentships: Awarded to applicants with at least one year of research experience beyond graduation, for one year, renewable twice on the basis of certified reports of satisfactory progress.

c) Special Scholarships: Awarded to outstanding Canadian applicants wishing to continue graduate studies at institutions outside Canada.

d) Other Post-graduate Scholarships and Fellowships.

The early emphasis of the NRC was to encourage more students to proceed to advanced degrees in the physical and natural sciences, but not to assist the universities in providing this training. The "universities would provide the money and facilities for training in basic research, and the council would supply the incentives to students to get that training."[78] But at the end of World War I, only two Canadian universities, Toronto and McGill, were offering a Ph.D. program. Moreover, by 1919, these universities had granted only 11 Ph.D. degrees in pure science.[79] There was little incentive to expand these programs because, in addition to financing problems, graduates were inclined to emigrate to employment in the United States.

Throughout the 1920s NRC's attention focused on establishing a National Research Institute. A bill to give the NRC the authority to do this was passed in the House of

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78 Senate Special Committee on Science Policy, A Science Policy for Canada, vol. I, (Ottawa: Queen's Printer, 1970), p.33.

79 Ibid., p.31.

Commons in 1921, but was defeated in the Senate - apparently because such an institute was expected to be independent not only of direct government control but even of the NRC itself.

Other attempts to establish the institute were made in 1924 and in 1928. After the Ontario government took the lead by announcing the formation of a provincial research foundation, the federal government announced that it would proceed with a research institute,[80] which finally opened its doors in 1932. By 1939, the staff had grown to 300.

The council was at that time providing about 40 scholarships each year at a cost of about $30,000. In the 20 years from 1919 to 1938, more than 400 persons had received such assistance, and about 25 percent of these had continued from their university studies into the NRC laboratories.[81]

The inter-war period for the NRC has been summarized in a few words:

> ...NRC had succeded in obtaining its own laboratories and in establishing a good relationship with the most important Canadian universities through its financial support. This was undoubtedly the major development that occured on the scientific front in Canada between the two world wars.[82]

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80 Mel Thistle, The Inner Ring (Toronto: University of Toronto Press, 1966), p.235.

81 Senate Special Committee on Science Policy, A Science Policy for Canada, vol. I, (Ottawa: Queen's Printer, 1970), p.49.

82 Ibid., p.52.

Within a few months of the start of World War II the staff of NCR laboratories had grown to 2500 with a budget of $7 million.[83] Much of this growth had been directed specifically to research on defence supplies and equipment. Shortly after the war, this aspect of NRC activities was separated and placed under a new organization, the Defence Research Board.

Defence Research Board

The Defence Research Board was established after World War II in an attempt to co-ordinate and continue existing military research as well as to develop new projects for future need. It was an offshoot of the National Research Council, which had co-operational with technical officers from the armed forces. In addition, the armed forces had carried out their own research independently. The Army operated six research and development establishments, the Air Force five and the Navy one. Towards the end of the war the problem arose as to what to do to ensure that advances made by Canadian scientists during the war years be properly consolidated. There was a fear that the war-time research teams would be attracted to the United States unless adequate provisions were made for them to continue their work in Canada.[84]

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83 Royal Commission on National Development in the Arts, Letters and Sciences, (1951), p.173.

84 This information on the establishment of the Defence Research Board is drawn from D.J. Goodspeed, A History of the Defence Research Board (Ottawa: Queen's Printer, 1958), pp.7-67.

With these factors in mind, the government established a Committee on Research for Defence in 1944 to discuss the form that defence research might take after the war. The Defence Research Board, responsible to the Department of National Defence, was established in 1946.

Canada Council

The formal origins of the Canada Council concept are probably to be found in one of the recommendations of the Rowell-Sirois Commission Report of 1940. The commission commented on the "excellent work which the [National Research] Council has been doing in close cooperation with Canadian universities..." In order to conduct similar work in the social sciences the commission suggested that:

> ...a Social Science Research Council which would co-ordinate and in some degree direct the research works in these sciences which is being done in Canadian universities and elsewhere. There is a real need for some such institution in Canada and it could serve a most useful purpose in analysing the social problems with which current legislation is designed to deal. (p.52).

Emphasis throughout the 1940s shifted from a council to co-ordinate social science research to an organization for administering a system of national scholarships and fellowships. In 1951 the Massy Commission recommended:

> that a body be created to be known as the Canada Council for the Encouragement of the Arts, Letters, Humanities and Social Sciences to stimulate and to help voluntary organizations within these fields, to foster Canada's cultural relations abroad, to perform the functions of a national commission for UNESCO, and to devise and administer a system of scholarships.[85]

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85 Royal Commission on National Development in the Arts, Letters and Sciences, 1951, p.377.

The recommended scholarships were to be awarded to post-graduate students from a federal government grant to the Canada Council.[86] There was also a recommendation for the "encouragement of mature and advanced work in the humanities, the social sciences and law,[87] and a recommendation that the Dominion-Provincial Bursary Scheme be "enlarged." While the commission was not prepared to recommend a precise number of undergraduates to be assisted it did give prominence to a plan which had been proposed and was suggested by the commission "for the guidance of the Government."

This was as follows:

1. 100 annual scholarships of $1000, tenable for four years, to be known as Canada Scholarships. These scholarships are intended to confer not only a valuable award but considerable prestige upon students of outstanding ability and exceptional promise. These scholarships, at least in our judgement, should be granted only after personal interviews.
2. 250 National Scholarships annually of $500, to be tenable for four years. These are intended for distinguished and promising students.
3. 2000 bursaries of $500 a year tenable for four years, for able and diligent students on the basis of need.
4. A loan fund open to all students whose work is acceptable to the authorities of their universities.[88]

In 1956, the Prime Minister, Louis St. Laurent, recalled that the Massey Commission had recommended the establishment of a Canada Council and added that:

> My colleagues and I have considered this proposal very carefully - some of our critcs would even say that we

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86 Ibid., p.358.

87 Ibid., p.359.

88 Ibid., p.362.

> have studied it for too long - and we are now prepared to recommend the creation of the Canada Council to Parliament at its next regular session.[89]

It is not clear why the federal government waited six years befor implementing the Massey Commission's recommendation concerning the Canada Council - especially in light of its haste in introducing the per capita grants for universities in 1951. N.A.M. MacKenzie credits the establishment of the Canada Council in 1957 partly to a surplus in the annual budget and the urging of John Deutsch. Wrote MacKenzie:

> I don't know if there was any definite reason for the delay in establishing the Canada Council other than the usual one of substantial amounts of money to new projects in the then questionable field of culture. One of the reasons why this was possible later on was due, in part, to the fact that the government had been able to show substantial surpluses in the annual budgets and I know that John Deutsch who was then attached to the Department of Finance did suggest and I suspect urged that some of these surpluses could be usefully used by creating the Canada Council and giving it a substantial capital amount which would make it possible to assist the universities in terms of their building programs in the fields covered by the terms of the Massey Commission and the Canada Council Act, and also endow the Council itself so that it would not be necessary to return to the government annually for further funds.[90]

On January 18, 1957, Prime Minister St. Laurent introduced the following resolution in the House of Commons:

> That it is expedient to introduce a measure to provide for the establishment of a Canada Council for the encouragement of the arts, humanities and social sciences and further to provide inter alia that a) the Minister of Finance may, out of the consolidated revenue

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89 "Address by the Prime Minister, "in C.T. Bissell, ed., Canada's Crisis in Higher Education (Toronto: University of Toronto Press, 1957), p.256.

90 Correspondence with the author, 15 December 1970.

> fund, pay to the council the sum of fifty million dollars to constitute an endowment fund for the purposes of the act, and b) the council shall establish a fund to be called the university capital grants fund, to which shall be credited the sum of fifty million dollars, to be paid to the council by the Minister of Finance out of the consolidated revenue fund."[91]

St. Laurent said the main object in establishing the Council was:

> "to provide some assistance to universities, to the arts, humanities and social sciences as well as to students in those fields without attempting in any way to control their activities or to tamper with their freedom."[92]

St. Laurent saw the need for a system of scholarships so that Canadians would not have to rely on foreign sources:

> "Our scholars and our students have had to rely mainly on foreign sources for grants-in-aid and for scholarships...I am sure that this too exclusive reliance on the generosity of others is not worthy of our real power and does not exemplify the real sense of values."[93]

Conclusions

Throughout the past 70 years of federal involvement in technical and higher education, the rationale for this involvement has been the federal government's responsibility and concern for manpower policies and economic development. After agreement was reached between the federal and provincial governments in 1910 on the appointment of a Royal Commission on Industrial Training and Technical Education, there has been relatively little debate about the constitutionality of federal programs for manpower development. Instead, the emphasis has been on the national economic interest, advancement of research, and uniformity of educational opportunity.

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91 Canada, House of Commons Debates, vol.1, (January 18, 1957): 391.

92 Ibid., p.396.

93 Ibid., p.393.

CHAPTER 3

CURRENT ROLE OF THE FEDERAL GOVERNMENT IN THE DEVELOPMENT OF HIGHLY QUALIFIED LABOUR

To examine the role of the federal government in the development of highly qualified labour is substantially similar to reviewing the government's participation in the financing of post-secondary education. The Statistics Canada definition of HQL was seen in Chapter 1 to be synonymous with post-secondary education; the MOSST definition also required at least some post-secondary education to reach 12 on the GED/SVP scale. This chapter, therefore, is substantially concerned with federal programs for support of post-secondary education, as the major means by which the stock of HQL may be modified.

These programs include the arrangements for fiscal transfers to the provinces, the Canada Student Loans Plan, graduate fellowships awarded by the research councils, tax expenditures made through deductions and credits, and other programs not directly included in the post-secondary educational system.

The programs are briefly outlined here to provide background information for Part II of the Report which evaluates the post-secondary system in terms of its HQL output and considers alternative actions the federal government might take in light of its interest in the markets for highly qualified labour.

FISCAL TRANSFERS FOR POST-SECONDARY EDUCATION

Federal Provincial Fiscal Arrangements Act, 1967

The federal government's per capita grants to universities (described in the previous chapter) were terminated in 1967. The federal contributions to non-university post-secondary institutions made through the Technical and Vocational Training Act were also phased out shortly after that Act was repealed in 1967. These funds for post-secondary education were largely replaced by amendments to the Federal-Provincial Fiscal Arrangements Act in 1967. Previous federal government tax abatements to the provinces were increased: 4 percentage points of personal income tax and 1 percentage point of corporate income tax were abated specifically as the federal contributions for post-secondary education.

An additional cash adjustment payment was provided so that the total federal transfer would equal either 50 percent of the provinces' post-secondary operating expenditures or alternatively, $15 per capita of the provincial population. This latter grant would be increased annually at the rate of increase in national post-secondary operating expenditures.

The Act was amended in 1972 to continue the same basic arrangements for post-secondary education to March 1974. An important modification, however, was the imposition of 15 percent maximum annual increase in the federal government's total payments for post-secondary education. Another amendment in 1973 extended these same terms to March 1977.

Federal-Provincial Fiscal Arrangements and Established Programs Financing Act, 1977

In 1977 the federal government made a major change in its arrangements for transfers to post-secondary education. A further 5 percentage points of personal income tax were turned over to the provinces, but the total tax points transferred were for the continuation of three "established programs": hospital insurance, medicare, and post-secondary education. A cash transfer was added to equalize provincial revenues to 50 percent of the national average per capita federal contribution for the three programs in 1975-76, and increased annually at the GNP growth rate. The federal contribution had thereby been separated from any current expenditure for post-secondary education. It simply became an unconditional grant to the provinces. Consequently, provinces generally have been allocating relatively less to post-secondary education and the nominal federal share has been increasing.

The 1977 Act is in effect until March 31, 1982, but the federal government announced in 1976 that it would give three years' notice prior to termination of the Established Programs Financing. While the tax points transferred to the provinces could not be reclaimed by the federal government, the cash transfer portion could be terminated after this three years' notice.

The federal fiscal transfers in the form of tax abatement and tax point reversions, and equalization and adjustment payments are shown in Table 17 for the period since 1967 when fiscal transfers were introduced for post-secondary education. The data for the EPF period show

TABLE 17

FEDERAL FISCAL TRANSFERS TO PROVINCIAL GOVERNMENTS

RELATED TO POST-SECONDARY EDUCATION, CANADA, 1967 TO 1980

Year	Tax Abatement and Equalization Payments	Cash Adjustment Payments	Total Payments
		(thousands of dollars)	
1967-67	$ 239.7	$ 181.9	$ 421.5
1968-69	293.5	233.9	527.4
1969-70	345.0	305.3	650.4
1970-71	380.8	415.9	796.6
1971-72	444.0	485.8	929.8
1972-73	530.3	481.8	1 012.1
1973-74	671.5	445.2	1 116.7
1974-75	773.3	503.6	1 276.9
1975-76	928.5	540.0	1 468.5
1976-77	939.7	648.7	1 588.4
Established Programs Financing began			
1977-78	1 059.2	1 077.2	2 136.4
1978-79	1 155.1	1 288.0	2 443.1
1979-80	1 243.2	1 532.3	2 775.5
1980-81	1 389.1	1 659.0	3 048.1

Source: Education Support Branch, Department of the Secretary of State, Canada; and The National Finances, Canadian Tax Foundation, annual.

that the cash adjustment payments have increased at a greater rate than the value of the tax points. The intention and expectation, however, had been that the cash adjustments would decline as a percentage of the total amount imputed to post-secondary education in the EPF program.

In Table 18 one can see the increasing importance of government grants in the universities' operating income, particularly since 1974. This arose in part because the tuition fees portion declined as the increase in fees lagged behind the general increase in income. Similarly, sponsored research income declined in relative terms as governments reduced their budgetary allocations for this purpose.

CANADA STUDENT LOAN PLAN

The Canada Student Loan Plan (CSLP) was introduced in 1964 to replace the earlier Dominion-Provincial Bursary Program with a much larger base for student financial assistance. Under this plan, the federal government guarantees loans made to eligible post-secondary students. Loan certificates issued by the educational institutions enable them to obtain loans from banks, trust companies, and other designated financial institutions.

Eligibility rules require that a student be in full-time study, meet an income needs test, be a Canadian citizen, or landed immigrant with one year's residency.

Provincial governments may choose to provide their own loan programs and receive an amount equal to what would have been allocated under the CSLP. Only Quebec has chosen this

TABLE 18

PERCENTAGE DISTRIBUTION OF UNIVERSITY OPERATING INCOME, BY SOURCE, CANADA, 1972 TO 1979

Year ending:	1972	1974	1976	1978	1979
Income Source					
Government grants	68.0	69.1	71.7	72.2	71.9
Fees	15.5	14.9	12.6	11.8	11.2
Sponsored research	12.4	12.5	11.7	11.9	12.3
Other income[a]	4.1	4.6	4.0	4.1	4.6
Total (billions of dollars)	1.3	1.6	2.2	2.6	2.9

[a] includes donations, investment income, net profit of ancillary enterprises.

Source: Statistics Canada, Financial Statistics of Education, No. 81-208, and unpublished data for 1977-78 and 1978-79.

option. The other provinces have combined their own grants program with the federal loans and administer the total package.

A student may borrow up to $1800 per year or a maximum of $9800. Interest on the loan is paid by the federal government until six months after the end of a study program. The graduate then assumes responsibility for the interest and principal which must be repaid within ten years of leaving the educational institution.

The allocation of guaranteed amounts available to each province is determined by dividing the Canada total among the provinces, based on the 18 to 24 year-old population in each province.

As at June 30, 1978, there was a total of $297.6 million outstanding in repayable loans (i.e., loans to students who were at least six months beyond the termination of studies). The total default rate since 1964 has been 7.7 percent, representing a total of $69.3 million to be collected, but to the end of 1977-78 only $1.9 million had been uncollectable and was written off. In 1978-79 there were 145,089 loan certificates issued to 122,400 students who received loans valued at almost $148 million, or about $1210 per student. About one third of all post-secondary students in Canada borrow through the Canada Student Loan Plan. The total cost of the CSLP to the federal government in 1979-80 consisted of the following items and amounts (in millions of dollars): interest payments, $32.9; loss and death claims, $26.2;

collection costs, $2.8; alternative payments (to Quebec to administer own plan) $21.7; service fees (to provinces for administration) $1.3; for a total net cost of $71.7 million, after allowing for recoveries of $13.2 million.

The distribution of loan certificates by level and field of study is shown in Table 19. The loans are distributed across fields of study in proportions very similar to the distribution of enrollments as seen in Table 20.

GRADUATE FELLOWSHIPS AND OTHER AWARDS

The federal government's contribution to post-secondary study is most direct and of special significance at the master and doctoral degree level. In addition to indirect institutional support through the provinces, the federal government's research councils make direct grants to universities and their faculties and award fellowships to individual students for graduate study. Only these latter fellowships are included in this section.

Social Sciences and Humanities Research Council

From 1957 until 1978, the Canada Council administered grants and fellowships in the social sciences and humanities, as well as in the creative and performing arts. On April 1, 1978, the newly-created Social Sciences and Humanities Research Council (SSHRC) assumed responsibility for research and study awards in those fields. Student fellowships had been restricted to doctoral degree candidates until 1972 when

TABLE 19

DISTRIBUTION OF LOANS CERTIFICATES BY FIELD AND LEVEL OF STUDY, CANADA, 1978-79

	Undergraduate	Master	Doctor	Other Post-Secondary	Total
Administration and Business	8 025	1 028	17	9 811	18 881
Agriculture	1 957	70	15	1 135	3 177
Arts and Sciences	48 880	1 755	346	9 395	60 376
Community Services	12 517	532	75	4 482	18 606
Engineering, Technology	7 719	715	43	8 937	17 414
Health, Medicine	6 403	185	101	10 622	17 311
Law	2 954	47	3	781	3 785
Other	1 159	315	28	5 037	6 539
Total	89 614	4 647	628	50 200	145 089

SOURCE: Canada Student Loans Program, Annual Report

TABLE 20

CANADA COUNCIL,[a], VALUE OF AWARDS

FOR GRADUATE STUDY, 1969 TO 1978

($ thousands)

Year	M.A. Scholarships Value	Doctoral Fellowships Value	Doctoral Fellowships Number
1969-70	---	$10 786	2 368
1970-71	---	11 316	2 456
1971-72	---	10 949	2 395
1972-73	$400	8 800	1 955
1973-74	502	9 125	1 722
1974-75	573	8 740	1 534
1975-76	650	8 800	1 387
1976-77	750	9 736	1 340
1977-78	703	10 159	1 327
1978-79	n.a.	9 126	1 333

[a] The Social Sciences and Humanities Research Council (SSHRC) was created in 1978 to become the granting agency for these fields of graduate study and research.

Source: Canada Council, Annual Reports.

about 125 special M.A. scholarships were introduced. This latter program has remained relatively small, as Table 20 shows.

The number of doctoral fellowships has declined by almost 50 percent since 1970. In 1977-78 the number of doctoral fellowships represented only 28 percent of total full-time enrollment in doctoral programs in the humanities and social sciences; whereas this proportion had been about 62 percent in 1970-71.

National Science and Engineering Research Council

This Council (NSERC) was also created in 1978 to assume responsibility for granting research and study awards in the natural sciences and engineering. Table 21 includes postdoctoral fellowships, as well as postgraduate scholarships, because they are intended to foster further study and research and hence contribute directly to further development of HQL. In addition to the number of direct award holders shown in Table 21 it is estimated by NSERC that about another 2000 graduate students are financially assisted indirectly through NSECRC grants to university researchers who employ graduate students as research assistants while those students are completing their thesis work.

The number of NSERC scholarships has also declined since 1970, but not as seriously as did the SSHRC (or Canada Council) fellowships. The decline in regular postdoctoral fellowships has been more than offset by the introduction and expansion of postdoctoral fellowships to be used for industrial research locations.

TABLE 21

NATIONAL RESEARCH COUNCIL[a] AWARD RECIPIENTS, CANADA, 1969 TO 1979

Year	Postgraduate Scholarships	1967 Science Scholarships	Bursaries	Postdoctoral Fellowships	Industrial Postdoctoral Fellowships
1969-70	1 780	102	388	227	--
1970-71	1,781	131	401	182	23
1971-72	1 630	126	324	170	36
1972-73	1 562	118	294	183	68
1973-74	1 557	113	53	177	91
1974-75	1 580	101	15	188	92
1975-76	1 625	94	16	143	75
1976-77	1 640	92	10	132	95
1977-78	n.a.	n.a.	n.a.	n.a.	n.a.
1978-79	1 365	85	12	134	127

[a] The National Science and Engineering Research Council was created in 1978 to become the granting agency in lieu of the National Research Council.

Source: National Research Council, Annual Report on Support of University Research.

TABLE 22

NATIONAL RESEARCH COUNCIL, VALUE OF AWARDS, CANADA 1969 TO 1979

($ thousands)

Year	Postgraduate Scholarships	1967 Science Scholarships	Bursaries	Postdoctoral Fellowships	Industrial Postdoctoral Fellowships
1969-70	$6 278	$650	$1 110	$1 230	$ --
1970-71	6 113	819	1 114	1 079	56
1971-72	5 979	880	1 058	1 070	195
1972-73	5 329	816	855	1 156	418
1973-74	5 778	768	317	1 252	687
1974-75	6 193	747	83	1 378	770
1975-76	7 629	624	68	1 421	772
1976-77	8 249	608	59	1 255	831
1977-78	8 457	608	73	1 223	1 222
1979-80	8 917	685	54	1 318	1,378

Source: National Research Council, Annual Report on Support of University Research.

NSERC post-graduate scholarships currently support about 50 percent of the Canadian and landed immigrant full-time graduate students enrolled in science and engineering. This is down from about 60 percent in the early 1970s.

Medical Research Council

The number of recipents of Medical Research Council awards for graduate study was not available, but the value of awards shown in Table 23 would suggest that the number of awards had declined since the early 1970s.

OTHER PROGRAMS

In addition to the major programs of federal support for HQL development described in preceding sections, there are several other programs which have an indirect or augmenting effect on the stock of HQL. These would include "tax expenditures" or forgone taxes due to deductible items, military trades and office training, public service staff training, bilingual instruction programs, and immigration policies.

The federal government has only recently begun to publish estimates of the cost, in terms of forgone tax revenues, of various exemptions from personal and corporation income tax. Tax expenditures are defined as:

> provisions that give preferential treatment to certain groups of individuals or businesses in the form of tax exemptions, deductions, reduced tax rates, or tax credits, thus granting a subsidy or incentive (by lowering or deferring tax liabilities) for those engaging in a specific activity or for those in certain special circumstances.[1]

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[1] The National Finances, 1980 (Toronto: Canadian Tax Foundation, 1980).

TABLE 23

MEDICAL RESEARCH COUNCIL, VALUE OF AWARDS, 1970 TO 1979

($ thousands)

Year	Studentships	Scholarships	Summer Scholarships
1970-71	$1 033	$1 776	$260
1971-72	1 086	2 016	410
1972-73	1 013	2 175	312
1973-74	963	2 372	308
1974-75	919	2 351	210
1975-76	972	2 634	215
1976-77	970	2 486	---
1977-78	1 100	2 400	300
1978-79	1 200	2 300	300

Source: Medical Research Council, President's Report, annual.

The estimates of tax expenditures for education are not published separately by level of education. Hence, the following amounts are estimates based on various assumptions concerning the distribution of these tax expenditures across levels of education. Data are for the 1979 tax year.

	Total	PSE[e]
	($millions)	
Non-taxation of the first $500 of scholarship and bursary income	$ 6.0	5.5
$50 per month education deduction	42.0	40.0
Deduction of tuition fees	41.0	41.0
Exemption of construction material and equipment bought by educational institutions from sales tax	52.0	20.0
Exemption of technical, educational, and other books from sales tax	28.0	15.0
Total	$169.0	$121.5

[e] Estimated

Data on military trades and officer training - particularly for training at the equivalent of the post-secondary level - are difficult to obtain. The Department of National Defence sponsors its personnel for postgraduate or refresher courses in universities, particularly in medical and dental programs. There is also extensive trades training in the services as well as instruction in engineering and public administration.

Similarly, the Public Service Commission sponsors a wide range of training programs, although the largest portion of enrollments are in courses relating to management and personnel administration. Individual departments in the federal government also provide employee training, both in general management skills and in specific topics related to the department's functional responsibilities.

The federal government's bilingual development programs also contribute to the development of HQL. This includes not only the extensive language training provided for federal employees, but also federal grants to assist selected post-secondary institutions in providing instruction in both official languages.

Immigration policy has a direct effect on the stock of HQL in Canada, but its role is discussed here only briefly since this report deals with the development of HQL in terms of domestic education and training. Table 24 shows that immigration of persons intending to take employment in professional occupations increased sharply in 1964 to 1968, then declined as abruptly in 1972. A temporary increase in 1974 has been followed by continuous decline. This pattern follows closely the pattern for total immigration to Canada which in turn is roughly the converse of the unemployment rate cycle. That is, the annual changes in permitted immigration are based largely on levels of unemployment.

The relative magnitudes of professional immigration were quite significant in the late 1960s when the annual inflow was equal to 50 to 75 percent of the bachelor degree entrants to the labour force. The total emigration of professionals (mainly to the United States) has not been quantitatively important in the past two decades, but has been important over short periods for specific occupations as, for example,

TABLE 24

IMMIGRATION AND EMIGRATION (TO U.S. ONLY) OF PERSONS IN PROFESSIONAL OCCUPATIONS,[a] CANADA, 1957 TO 1979

Year	Immigration	Emigration to the United States
1954	8 350	3 352
1959	6 947	5 593
1964	11 965	6 171
1966	23 637	4 926
1968	29 250	n.a.
1970	22 412	1 476
1972	15 262	1 437
1974	21 599	904
1976	14 378	n.a.
1977	10 793	n.a.
1978	7 849	n.a.

[a] defined by the Census occupational clarification system in effect for the given year

Sources: Immigration data from Immigration Statistics, published by Canada Department of Citizenship and Immigration and successor departments.

Emigration data from the United States Department of Justice, Immigration and Naturalization Service, Annual Reports.

engineers or physicians emigrate in response to changes in relative earnings. Recently, emigration to the United States has been sharply curtailed by a stricter U.S. immigration policy.

PART II

CHAPTER 1

EVALUATION OF THE DEVELOPMENT OF HIGHLY QUALIFIED LABOUR IN CANADA

This chapter deals with two major topics or questions: What are the appropriate criteria for evaluating the federal role in the development of highly qualified labour and what are the results when these criteria are applied to the evidence?

In Part One the discussion of the rationale for public intervention - particularly by the federal government - in the development of HQL was based on the allocation, distribution, and stabilization functions of government, with emphasis on allocation. Under this heading it was argued that intervention was required on the supply side of labour markets for HQL to deal both with market imperfections and with externalities.

Since the federal government is responsible for economic growth and increased labour productivity, it is directly concerned with efficient resource allocation in the development of HQL. This raises questions about both output of the educational system as well as its internal efficiency. Hence, one must determine whether productivity could be improved by a reallocation of resources within the post-secondary system or between this system and other institutions warranting federal support. The usual explantion for less-than-perfect resource allocation is the existence of imperfections in the education market (due to inappropriate provision of capacity on the supply side or inadequate financing on the demand side due to risk aversion,

lack of tangible collateral, or poor information) and/or in the labour market (due, for example, to inadequate information or legislated barriers such as occupational licensing and trade unions).

The externalities which the federal government must attempt to internalize in the development of HQL include effects that are "in the national interest." These would include, for example, the development of a Canadian cultural infrastructure of creative and performing arts and a highly-developed base for scientific research. Although each of these examples would receive some attention from provincial governments, the result is likely to be quantitatively less than would be warranted by a national perspective.

Finally, the federal government is the largest employer of HQL in Canada and thus has a direct interest in assuring that the number of trained persons it requires will be available at appropriate relative wages.

EVALUATION CRITERIA

Although the federal government contributes only indirectly to the financing of post-secondary education, its contribution is large and general and hence evaluation of its role must be synonomous with an evaluation of total investment in the post-secondary system. From this approach, it should be possible to determine the scope and direction for alternative resource allocation.

A common technique for evaluating the efficiency aspect of resource allocation decisions is benefit/cost analysis. Other criteria or indicators are also used which are more directly related to the labour market. Such indicators

include changes in relative earnings of graduates, unemployment and job vacancy rates, and various other measures of excess demand or supply. These criteria will be used in the evaluation exercise following this benefit/cost section.

Benefit/cost analysis

The conceptual basis for benefit/cost analysis is to take account of all benefits and all costs that result from implementation of a particular project. Benefits and costs must include those realized by persons directly involved in the projects (the graduates from an educational program), those realized indirectly by persons associated with the graduates, and those realized by wider groups or the whole economy. Operationally, however, calculations have tended to include only those benefits and costs that can be measured in monetary terms.

Benefit/cost calculations are made from the perspective of the total economy (the social returns) or that of the individual student (the private returns). Total costs include direct expenditures of educational institutions, depreciation of physical assets and imputed forgone interest on those assets, forgone taxes, students' expenditures for books, supplies, transportation, and living costs additional to those normally incurred in other activities, and students' forgone earnings net of part-time employment income.

Total benefits are usually confined by data limitations to the graduates' expected lifetime earnings minus the average earnings of graduates at the educational level selected for comparison. These earnings differentials are illustrated in Figure 1. Differentials are usually adjusted for unemployment, labour force participation rates, mortality rates, and economic growth rates.

Private costs include students' direct expenditures plus net forgone earnings. The private benefits are earnings differentials as calculated above, less income tax on the differential.

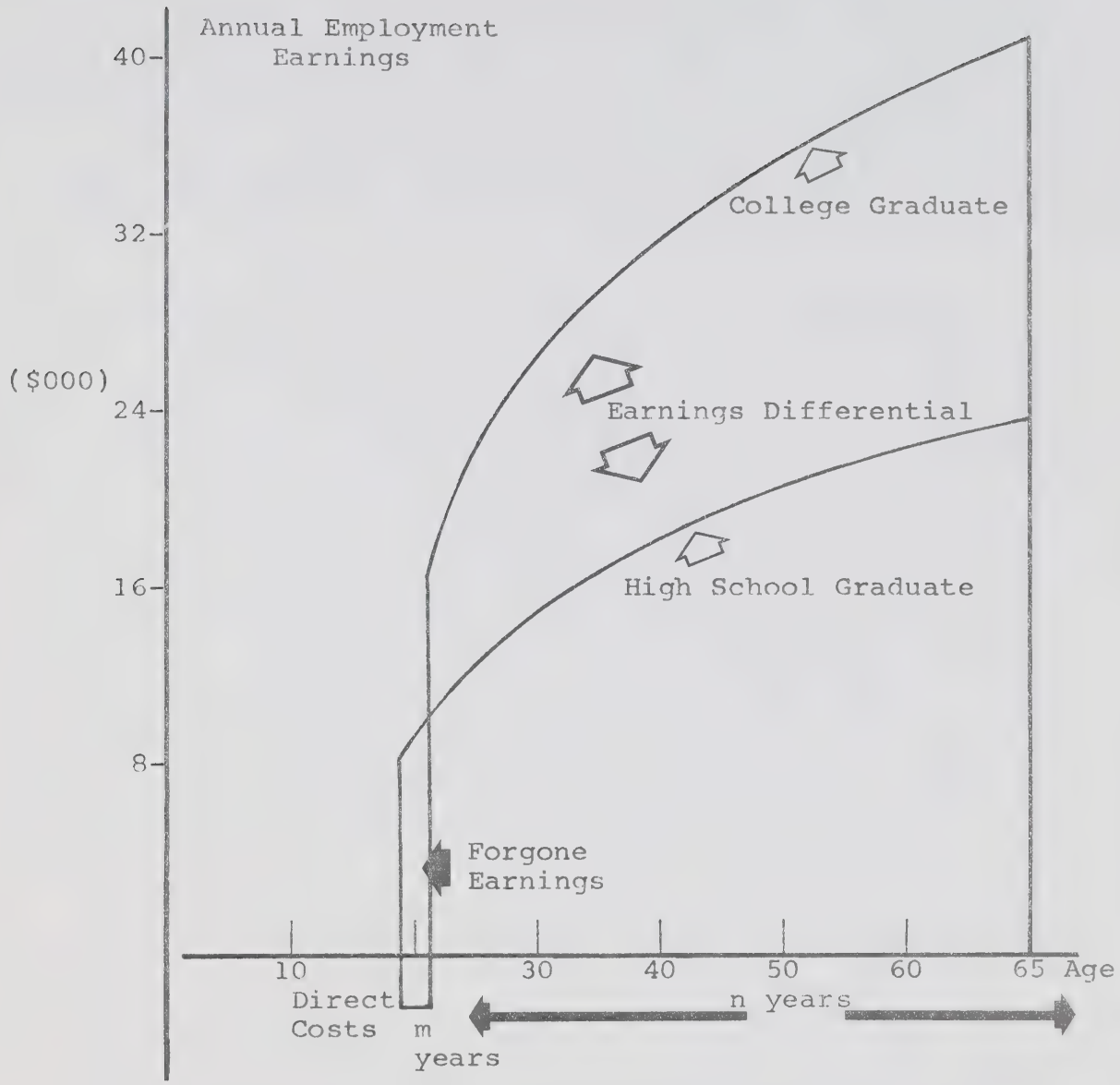
Net benefits are determined by one or more of these common calculation techniques: net present value, benefit/cost ratio, and internal rate of return.

The net present value is given by the formula:

$$NPV = \sum_{t=1}^{n} \frac{B_t}{(1+i)^t} - \sum_{t=1}^{m} \frac{C_t}{(1+i)^t}$$

where NPV is the net present value at the age of enrolment in the program, n is the length of the earnings period in years, m is the length of the educational period in years, B_t is the adjusted earnings differential in year t, C_t is the total cost per student in the year t and i is the selected discount rate.

The benefit/cost ratio is obtained by dividing the total discounted benefits by the total discounted costs as shown above. The internal rate of return is the discount rate which makes the present value of the total benefits equal to the total costs in the above formula. This measure is more commonly cited than the other two because present values can be compared directly only for a given time period and monetary unit, while benefit/cost ratios must specify the discount rate used in the calculation.



HYPOTHETICAL LIFETIME EARNINGS PROFILES
FOR HIGH SCHOOL AND COLLEGE GRADUATES

FIGURE 1

Caveats and objections to benefit/cost analysis for post-secondary education

A number of objections to benefit/cost analysis in evaluating and developing education policy have arisen during the past two decades. Recent empirical work has settled some of these issues but much controversy remains. It is important, therefore, to treat the more substantial issues here, if only in highly summarized form.[1]

1. The quality of the earnings data is in dispute. The data are usually drawn from surveys of individuals; this raises questions about the appropriateness of sampling techniques and the accuracy of individuals' reporting of their incomes. It seems plausible to assume that the under-reporting of earnings is indirectly related to the level of incomes and, hence, that differences in rates of return across occupations may be under-estimated. This effect is accentuated by the omission of fringe benefits from earnings data since the absolute value of such benefits increases with earnings levels. Furthermore, earnings data are usually cross-sectional by age rather than longtitudinal (or historical) and thus are only an approximation of an individual's earnings experience. In the same sense, ex post data are used as ex ante approximations.

2. Both earnings and cost data are usually average rather than marginal values. Rate of return estimates therefore need to be adjusted for the incremental effects of

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[1] For a comprehensive review of several of these topics see Mark Blaug, "Human Capital Theory: A Slightly Jaundiced Survey," Journal of Economic Literature 14(3) (Sept. 1976): 827-955.

small changes in enrollments or graduates. The general assumption in labour economics is that marginal earnings decline with increased labour input; conversely, the limited evidence on educational costs points towards increasing marginal costs. Consequently, marginal rates of return are more likely to be decreasing than constant or increasing - particularly for post-secondary education at current enrolment levels.

3. A major difficulty in using rates of return for policy purposes is that externalities are omitted from the caluclation. These may be quiet substantial - especially at the college level - but there has been no systematic attempt to quantify externalities. One might assume that the marginal value of externalities declines sharply at existing output levels in post-secondary education since the rhetoric on externalities makes reference to "leadership," "innovations," and "technological breakthroughs" which are not necessarily monotonically related to output levels. The true rate of return for any marginal enrolment therefore would be difficult to estimate if both the marginal monetary and non-monetary benefits decline sharply.

4. Although it has long been acknowledged that earnings associated with different education levels also reflect different "ability," there was no acceptable information or adequate technique for isolating this effect. Early calculations were based simply on alternative assumptions about the fraction of the earnings differential attributable

to "native ability." More recently, studies have found "ability" to account for a significant portion of earnings differentials, but schooling and ability are so strongly complementary that precise estimates are difficult.[2]

5. A major criticism of the social rates of return has been that they do not measure the effect of further learning. Rather, the higher earnings are said to represent a premium paid by employers for the certification that the individual concerned possesses certain attributes that the employer believes to be appropriate to learning or performing certain job functions. This "screening" hypothesis is challenged by the argument that an employer uses education certification only as an initial sorting device at the time of hiring. Subsequently employers can observe workers' productivity closely and will not base salaries on educational qualifications for very long.

6. A further argument against the social return measure is that the more-educated persons simply displace the less-educated persons for specific jobs. College certificates give these people an advantage in job

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2 See Paul Taubman and Terence Wales, "Education as an Investment and a Screening Device," in F.T. Juster ed., Education, Income, and Human Behaviour (New York: McGraw-Hill, 1975) pp. 95-122; also John Hause, "Ability and School as Determinants of Earnings, or If you're so smart why aren't you rich?" American Economic Review 61: 289-298; and J.D. Welland, "Schooling and Ability as Earnings Complements," Canadian Journal of Economics XIII(2), (May, 1980): 356-367.

competition but do not mean that they are necessarily more productive. Cartter labelled this effect "job bumping" since the more highly qualified simply bump the lesser qualified from a job. Thurow pushed this argument further by suggesting that marginal productivity is associated with the job rather than with the individual holding the job.[3] A person with a higher level of education is more likely to be hired for a given job, with the result that the returns will - other things being equal - be higher for higher levels of education. The returns to a given level of education may therefore decline over time as persons of given schooling levels are employed in jobs with lower marginal productivity.

Comparison of social and private rates of return

When the results of benefit/cost analysis of post-secondary education are reviewed for policy purposes, the questions often asked are Who benefits? Who pays? Who should pay? But these questions are related to equity or distributional considerations. The question to be asked when the objective is efficient resource allocation is What degree of public subsidy (if any) is required to achieve the socially optimal output of HQL?

It is frequently suggested that if the private rate of return exceeds the social rate, there is or could be an overinvestment in that type of education from the economy's point of view and that public subsidy should therefore be

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3 Lester C. Thurow, "Measuring the Economic Benefits of Education," in Higher Education and the Labour Market, M.S. Gordon, ed. (New York: McGraw-Hill, 1974).

reduced.[4] But whether the social returns are greater or less than the private returns depends partly on the assumptions used in adjusting the lifetime earnings streams. Private rates tend to exceed social rates where earnings differentials are larger at higher ages (with higher income tax brackets) and thus where a high internal rate is required to equate earnings and costs.

From the individual's perspective, post-secondary education has both an investment aspect in that it can generate a higher future income and a consumption aspect manifested in a student's enjoyment of social, athletic, and cultural experiences at a post-secondary institution. But benefit/cost studies usually assume that the total educational cost should be treated as investment. Thus, the greater the true consumption component of education, the greater is the underestimate of the true private rate of return. A similar consideration is not applicable to social returns since this approach is not concerned with the consumption aspect of investment in post-secondary education.

Social and private rates are not directly comparable because the individual has a higher degree of risk and uncertainty, and likely has a higher rate of time preference, than does the total economy when investing in a particular educational program. Also, the omission of externalities from the social calculation means that this rate of return is necessarily understated.

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[4] See, for example, W. Lee Hansen, "Total and Private Rates of Return to Invesment in Schooling," Journal of Political Economy 71(2) (April, 1963) p. 137.

On balance, one could reasonably assume that, generally, private rates should be expected to exceed social rates and that public overinvestment in education is not necessarily implied by this difference. There may, however, be private overinvestment despite higher private returns. In a study of university undergraduates it was found that students tended to overestimate lifetime earnings in their first choice of career and to underestimate the educational costs, mainly through neglecting forgone earnings or discounting these at a reasonable rate. Under such circumstances students' career choices would imply overinvestment.[5]

The policy significance of the private-social rates differential lies simply in the information and guidance this difference provides for public decisions concerning subsidies to different programs. The comparison that should be made is among the social rates of return across various educational levels and programs. There is relative overinvestment in a specific area only if the return to marginal expenditures in that area is less than the return to marginal expenditures in other areas. Thus, public funds, in principle, should be directed to projects having high social rates of return even though private returns are also high. The increased subsidy should increase graduates of that program and hence lower the relative earnings differential until the social return is equated with the return on other programs.

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5 D.A. Dodge and N.M Swan, "Factors Influencing Career Choices of Students," Discussion Paper No. 48 (Kingston: Queen's University Institute for Economic Research, May, 1971).

Comparisons over time

A controversy is now emerging in the United States over whether there was a significant decline in the returns to higher education in the 1970s. The apparent decline in returns is symbolized by the titles of two journal articles. In 1960 Becker published the classic article "Underinvestment in College Education?"[6] Fifteen years later Freeman responded with an article titled "Overinvestment in College Training?"[7] Becker found that by making crude adjustments to rate of return calculations the return on college education was approximately 9 percent. That was not very different from the average return to all business capital of about 8 percent. Larger public expenditures on higher education, therefore, were not warranted on the basis of direct returns, but might be justified if external benefits of human capital were greater than for physical capital or if, as Becker argued, increasing the fraction of able persons going to college would raise the average return from college.[8]

Freeman's article reported that the social rate of return for male graduates of four-year colleges in the United States had first increased from 10.5 percent in 1959 to 11.1 percent in 1969 and had then fallen to 9.5 percent in 1972

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6 Gary S. Becker, "Underinvestment in College Education?" American Economic Review 50 (May, 1960): 346-54.

7 R.B. Freeman, "Overinvestment in College Training?" Journal of Human Resources X(3): 287-311.

8 Becker, AMR (May,1960) p. 354.

and 7.5 percent in 1974.[9] These results attracted much attention when Freeman's book, "The Overeducated American" appeared in 1976.[10] Although Freeman's results have recently been challenged by some economists,[11] his defense has strengthened his previous conclusions.[12] The decline in the social rate of return since 1969 assumes much greater significance in the context of another recent study which confirms Becker's earlier reports of a roughly constant rate of return from 1939. Carnoy and Marenbach found that the social rate of return for white U.S. males with a four-year college education was approximately 11 percent for this 30-year period.[13]

Data are not available for Canada to allow comparison of social rates of return across the 1970s, but two studies are available for the 1960s. The Ecomomic Council of Canada estimated the social rate of retrun to a bachelor's degree

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9 Freeman, Journal of Human Resources X(3): Table 4.

10 R.B. Freeman, The Overeducated American (New York: American Press, 1976).

11 See comments by Rumberger, Witmer, Schwartz and Thornton in "An Exchange," Journal of Human Resources XV(1) (Winter, 1980): 99-142.

12 Freeman, Ibid.

13 Martin Carnoy and Dieter Marenbach, "The Return to Schooling in the United States, 1939-69," Journal of Human Resources X(3) (Summer, 1975): Table 2. Specifically, the rates were 10.7 in 1939, 11.3 in 1959 and 10.9 in 1969.

for males to be 12 percent in 1961 and 11 percent in 1967, based on the assumption that formal education accounted for 60 percent of the earnings differential.[14] Another study, by Mehmet, compares private (not social) rates of return from 1961 to 1972. On average the private returns rose from 14 percent in 1961 to 22 percent in 1969 but dropped to 18 percent for 1972.[15] These rates are higher than those Freeman found for the United States, but the direction of change is the same - particularly the turning period of 1969 to 1972.

Similar results were also found in calculations of private rates of return in Great Britain for male university graduates in science and engineering:

> It is clear that the rate of return to undertaking degree level courses in scientific disciplines had declined significantly since the mid 1960s...the most likely cause of the decline...is that supply has outpaced demand over this period.[16]

Alternative market adjustment models

Freeman's view is that the decline in the social returns in the 1970s was a relatively short cyclical effect rather than the beginning of a long-term trend:

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14 Economic Council of Canada, Eighth Annual Review: Design for Design-Making (Ottawa: Information Canada, 1971), p.210.

15 Ozay Mehmet, "Economic Returns on Undergraduate Fields of Study in Canadian Universities: 1961 to 1972," Industrial Relations Industrielles 32(3): 321-339.

16 R.A. Wilson, "The Rate of Return to Becoming a Qualified Scientist or Engineer in Great Britain, 1966-1976," Scottish Journal of Political Economy 27(1) (February, 1980):41-62.

> Forecasts of the state of the college labour market... indicate that the economic position of new bachelor's [degree] men is likely to remain depressed through the end of the 1970s, will improve moderately in the 1980s and rapidly in the late 1980s, though not to the boom conditions of the 1960s. The major force improving the market will be a reduced supply of new baccalaureates.[17]

This forecast is based on Freeman's model of the college graduates' job market which he describes in terms of four major factors:

> [1] the responsive supply behaviour of the young; [2] the long working life of graduates, which makes total supply relatively fixed in the short run; [3] the concentration of graduates in certain sectors of the economy and moderate substitutability between college-trained and other workers; [4] and the cobweb feedback system, which leads to recurrent market oscillations, as high salaries and job opportunities induce many students into fields, producing a flood of graduates 2 to 5 years later, and, all else the same, a relative surplus that in turn reduces salaries and employment opportunities, depressing enrolments, and so on.[18]

A somewhat similar supply-dominated model is proposed by Dresch.[19] He emphasizes the proportion of new post-secondary graduates in the labour force and assumes that the relative salaries of college graduates are inversely related to the proportion of college graduates in the total labour force. Some allowance is made for demand influences through changes in technology requiring a slight increase in the college-graduate share of the labour force. With this model

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17 Freeman, The Overeducated American, p.187.

18 Freeman, The Overeducated American, p.185.

19 Stephen P. Dresch, "Demography, Technology and Higher Education," Journal of Political Economy 83 (June, 1975): 535-569.

applied to U.S. data, Dresch estimates that the educated share of the labour force and their relative salaries were in long-run equilibrium in 1979-80, but the continuing large flow of college graduates into the labour force caused a further decline in relative salaries. It is not until 1999 that the market is expected to be restored to equilibrium. Dresch concludes:

> Thus, the process of educational adaptation over this 45 year span [1960-2005] is one of cycling about a moving equilibrium, with the amplitude of this cycle determined primarily by the underlying wavelike movement in demography. That is, the lags in the educational adjustment process, which would generate a degree of disequilibrium in any event, are magnified by the succession of expanding and contracting entering cohorts.[20]

Another study has argued that the behaviour of the market for college graduates is dominated by the demand side, rather than the supply side:

> If the market-driven models of Freeman and Dresch are correct, the college-graduate labour market will be brought into equilibrium largely by the supply response of students. If the...model proposed here [by Bishop] is correct, most of the post-war rise in enrollment rates is due to trend improvements in the income and education of the population and reduction in real cost of college attendance.[21]

Bishop adds that the establishment of public colleges in new areas, expansion of student aid, and more liberal admission policies also increased enrolments but that the effect of these policies may have diminished sharply.

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[20] Ibid., p. 562.

[21] John Bishop, "The Effect of Public Policies on the Demand for Higher Education," Journal of Human Resources XII(3) (Summer, 1977), p.302.

To the extent that the dominant factors are on the demand side, "a large supply response to the current depressed state of the college-graduate labour market is not very likely unless the end of the shortage of college graduates induces a shift in public policy."[22] With no such "policy shift," enrolments will not decline as forecast by Freeman and hence the market will approach equilibrium at lower relative salaries than Freeman predicts.

These forecasting models are important in their attempts to include major determinants of the supply, demand, and relative salaries for HQL. Their outcomes differ in degree but not in direction. It seems reasonable to conclude that the social rate of return on post-secondary education will continue to decline. Even for the student who is entering college only now and is expecting to enter the labour force about 1985, the first 15 years of earnings differentials - especially at today's higher discount rates - are sufficient to determine the social rate of return associated with his schooling. At any rate below the 7.5 percent Freeman calculated for 1974, there would seem to be a case for reducing resources allocated to post-secondary education. But it must be recalled that these calculations do not include externalities, which even at the margin may significantly increase the estimated return. There is also the possibility that a reallocation of resources within the post-secondary sector would improve the over-all rate of return. With this latter possibility in mind, one should turn next to comparisons of returns to different fields of study.

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22 Ibid.

Comparisons among fields of study and occupations

Most of the methodological problems in using rates of return as an educational investment criterion can be set aside when comparisons are made across fields of study or occupations that are dominated by post-secondary graduates. Variations in externalities, effect of "ability," screening effects, and so on, likely are less significant among this group than between high school and college graduates. Thus, the relative rates of return among college graduates at least serve as a resource allocation guide, even if the absolute levels are in dispute. Unfortunately, there has been much less work on net social returns to specific fields than on the returns to college education in general.

A comprehensive study of the Ontario post-secondary system estimated social returns based on 1961 data which can nevertheless offer guidance on relative magnitudes.[23] The social rate of return for male graduates was highest for dentistry (17%), followed by medicine (11.5%), commerce (11.5%), law (10%), engineering (9%), and pharmacy (9%). The lowest ranking fields were music (6%), education (6%), and social work (-1%). These results were based on the assumption that one-third of the earnings differential was due to factors other than education. Similar conclusions were found for the Ontario post-secondary system based on 1968 cost data, and 1961 earnings data inflated to 1968.

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23 David Stager, "Monetary Returns to Post-Secondary Education in Ontario, 1960-64," unpublished Ph.D. dissertation, Princeton University.,

Returns to post-secondary education have also been calculated for Australia. The results are reported for male graduates of various fields and levels of study for 1969.[24] These are expressed as social benefit/cost ratios rather than internal rates but the rank order of the results can be compared with the Canadian results. Also, from the discount rate used it is possible to estimate roughly the internal rate. Any closer comparison is unwarranted due to different adjustment of the raw data.

For university degrees, the highest returns are for dentistry and law (at roughly 15%) followed by economics (12%), medicine (8%) and then arts, engineering, science, and finally education. The net returns are even lower for master and doctorate degrees in engineering and sciences. For the diploma graduates of the technical colleges, the implied rates of return were higher than for engineering or science university degree, with certificates in engineering and business showing benefit/cost ratios of at least double the ratio for dentistry and law.

An extensive study in the United States of returns to different educational levels for a given occupation and to different occupations again produced similar results.[25] In all of these studies, the net returns are highest for medicine, dentistry, and law, with engineering and commerce

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24 C. Selby-Smith, "Rates of Return to Post-Secondary Education in Australia," Economic Record (December, 1975): 455-485.

25 Richard S. Eckaus, Estimating the Returns to Education: A Disaggregated Approach (Berkeley, California: Carnegie Commission on Higher Education, 1973).

also having above-average returns. The lowest returns are in education and social work. The returns are generally also lower for graduate study.[26]

In each of these cases, however, one must recognize the wide variation in rates of return among disaggregated groups within any general category. Eckaus emphasizes that:

> A major conclusion of this study is that there is not one rate of return to education at each level. There are many. There are many educational investment projects that differ not only by the level of the education involved but also by the use of the education.[27]

Since the substantial differences in rates of return to different professions or fields of study persist over time and are similar in various countries, there may be general factors explaining this common pattern. In perfectly competitive educational and labour markets the differences in net returns should disappear as individuals seek the highest return - unless there are differences in the nature of the work that requires monetary compensation. The persistent differences that are observed, however, suggest that there are major labour market imperfections, or that inter-occupational mobility is costly, or that there are systematic quality or innate differences among persons in different occupations.

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26 David Dodge and David Stager, "Economic Returns to Graduate Study in Science, Engineering and Business," Canadian Journal of Economics vol. 5,(1972):182-198.

27 Richard S. Eckaus, Estimating the Returns to Education (1973) pp. 52-53. Underlining added.

Since the highest returns are in medicine, law, and dentistry, and the lowest are in education and social work, there is a prima facie case for monopolistic effects in the self-regulating professions and monopsonistic effects in the professions employed almost exclusively by the public sector. A recent study of occupational earnings confirms this.[28] Fogel compared actual earnings with those predicted by a competitive human capital model and found that managers have a "premium" of 20 to 40 percent, for physicians it is 20 to 30 percent, and 15 to 20 percent for lawyers. Conversely, teachers and social workers earn about 20 to 40 percent below the predicted level.

If these institutional or non-market effects can be interpreted as a measure of the discrepancy between earnings and the social marginal value product, then the social rates of return should be adjusted accordingly. Without making detailed recalculations, it is nevertheless clear that the range of returns to various university fields of study would be sharply narrowed.

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28 Walter Fogel, "Occupational Earnings: Market and Institutional Influences," Industrial and Labour Relations Review Vol. 33, No.1 (October, 1979):24-35. A recent article by Timothy R. Muzondo and Bohimir Pazderka, "Occupational licensing and professional incomes in Canada," Canadian Journal of Economics XIII, 4 (November, 1980): 659-667, concludes that advertising restrictions increase professional earnings by 33 percent. David Dodge also suggests the general hypothesis that "market imperfections may be positively correlated with the level of education of workers" and cites evidence that industrial concentration is postively correlated with employees' education levels. See David Dodge, Returns to Investment in University Training (Kingston: Queen's University, 1972),p.113.

Conclusions

The preceding sections have argued that social rates of return to education - properly qualified by various methodological objections - can offer more concise guidance on policy decisions than any other objective criteria. Social returns to post-secondary education should be compared with the returns to resources allocated elsewhere in the economy, exercising care to include consideration of externalities. Although returns to education have declined in the past decade, this in not sufficient reason to argue that there has been "overinvestment" in education. To repeat, it is a matter of comparing expected returns across alternative investment projects. Although the rates of return are expected to decline still further, the declining relative earnings for college graduates are expected to reduce the proportion of college graduates in the labour force, followed by a gradual improvement in relative earnings and rates of return.

This suggests that public policy should not react in quantum leaps as it did in the early 1960s when it increased post-secondary facilities and financing so abruptly. In fact, there may already have been an excessively strong contractionary reaction to the unexpected "dip" in university enrolements in the early 1970s.

The differences in rates of return to different fields or occupations - even after adjusting earnings for the effects of imperfect labour markets - suggest that modest shifts in resource allocation towards health, business and technology may be warranted.

Finally, public policy can never be designed and implemented to bring about precisely the desired result. In the case of education, it may be better to err on the side of overinvestment rather than the opposite. A major manpower study has argued that:

> The cost to the economy of an inadequate supply of educated persons is probably greater than the expenditure of resources involved in creation of an excess of graduates beyond the needs of the economy, and in this sense an over-expanded educational system is less costly than an underdeveloped one.[29]

DIRECT LABOUR MARKET CRITERIA

Graduates experience in the labour market

Another approach to evaluating the development of HQL lies in examining the labour market experience of recent post-secondary graduates. There have been a number of such surveys but none so specifically directed to labour market aspects as a recent survey by Statistics Canada.[30] A sample of graduates from universities or community colleges in 1976 was surveyed in June 1978. Some of the results are presented in Table 1.

One must be cautious in interpreting these data. Consider first the labour force participation rates. These are lower for universities than for colleges partly because some bachelor degree graduates would be in full-time graduate study at the time of the survey. The "underemployement rate" is based in part on subjective views of respondents

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29 John K. Folger, Helen S. Astin and Alan E. Bayer, Human Resources and Higher Education (New York: Russell Sage Foundation, 1970), p. 42.

30 Statistics Canada, Job Market Reality for Post-Secondary Graduates, Cat. No. 81-572. (Ottawa: Supply and Services Canada, 1981).

TABLE 1

LABOUR MARKET EXPERIENCE OF 1976

UNIVERSITY AND COLLEGE GRADUATES

TWO YEARS AFTER GRADUATION, CANADA[a]

	Labour Force Part.Rate[b]	Unemployment Rate[c]	Underemployment Rate[d]	Median Salary[e]
Total University[f]	93.2	8.4	37.7	$14 800
Bus., Manage., Commerce	97.5	4.4	32.4	14 900
Education	96.2	4.8	28.2	15 000
Fine and Applied Arts	93.1	14.1	39.5	13 000
Humanities	91.9	10.9	49.8	14 000
Social Sciences	92.7	10.3	47.2	14 600
Agric., Bio. Sciences	86.2	11.1[h]	40.1	13 400
Engineering	96.5	5.2[h]	13.1[h]	18 000
Architecture	99.3	--	32.0[h]	15 200
Dentistry	96.0	--	--	27 000+
Medicine	93.2	6.5[h]	--	16 200
Nursing	94.1	--	37.5	14 700
Pharmacy	97.2	--	--	17 700
Math., Physical Sciences	91.6	10.3	34.3	14 800
Total College[g]	96.0	6.7	25.3	12 300
Fine, Appl., Perform. Arts	91.9	11.9	36.1	10 100
Bus., Manage., Commerce	97.6	6.4	39.9	12 500
Secretarial Arts, Sciences	96.1	5.6	40.9	9 100
Data Proc., Comp. Sciences	97.4	--	19.8	13 800
Primary Industries	98.5	7.2	28.4	13 200
Medical, Dental Services	95.2	6.1	6.2	12 900
Technologies	98.3	5.2	28.9	13 800
Transportation	97.6	--	52.7	13 600
Mass Communication	97.5	6.8[h]	37.2	11 300
Community Services	94.2	10.0	28.7	11 000
General Arts and Sciences	93.2	8.3	28.6	10 100

Notes and Source see next page.

NOTES FOR TABLE 1

Notes:

a. Excludes Quebec which did not participate in the survey.

b. Includes all persons except those not looking for a job.

c. Includes persons who were not working and were looking for a job at the time of the survey.

d. The percentage of graduates who were underemployed is a combination of those whose academic qualifications were higher than the formal requirements of their jobs and those who felt that their level of attainement was not necessary for the job, regardless of its formal requirements. A somewhat complex mathematical procedure was used to make this determination.

e. The question was based on an interval scale so that a respondent could record only the range within which the salary fell. The highest level was $27,000.

f. Bachelor and first professional degree graduates only; excludes university diplomas or certificates and master's and doctorate degrees.

g. Graduates of 1 to 4 year programs in community colleges and the CEGEPs.

h. Number of respondents is small; the data must be treated with caution.

Source: Statistics Canada, Job Market Reality for Post-Secondary Graduates, (1981). The data are based on a large sample survey of 1976 graduates conducted in June 1978.

concerning the relationship of their level of education and their job function. The bias is likely to be uni-directional in such cases; few persons are likely to be employed in jobs which require higher formal skill levels than are implied by their educational qualifications. Moreover, the graduates from fields of study with high underemployment rates, such as the humanities and the social sciences, have salaries comparable to those in education where underemployment is low. In the case of college graduates, the occupational class with the highest underemployment rate - transportation - also has the second highest salary level.

Nonetheless, there is unequivocal evidence to be drawn from the data. Certain fields of study are associated with high participation rates, low rates of both unemployment and underemployment, and higher salaries. Among the university fields these include business and commerce, education, engineering, architecture, dentistry, and pharmacy; in other words, the traditional professions. For the colleges, the comparable fields would include data processing, medical and dental services, and technologies.

Table 2 shows the dominant occupation entered by graduates of the different fields of study, and the percentage of the graduates choosing that occupation. One remarkable observation is that 30 percent of all bachelor degree graduates become elementary or secondary school teachers and at a salary more than $1000 greater than the average for the remaining 70 percent. Almost all (96%) dentistry graduates practice dentistry, and there is almost as strong a link between field of study and occupation for physicians, nurses, and pharmacists.

TABLE 2

MOST COMMON OCCUPATION OF EMPLOYMENT FOR 1976

UNIVERSITY AND COLLEGE GRADUATES, CANADA

	Most Common Occupation of Employment[b]	Median Salary	Percent of Total Grads in Occupation[c]
Total University	School Teachers[e]	$15 800	30
Bus., Manage., Comm.	Management Support	15 300	38
Education	School Teachers[e]	15 400	67
Fine and Applied Arts	Teachers[d]	15 300	40
Humanities	School Teachers[e]	16 700	39
Social Sciences	School Teachers[e]	18 300	23
Agric., Bio., Sciences	School Teachers[e]	15 000	15
Engineering	Arch. and Engineers	18 400	61
Architecture	Architects and Engineers	15 100	67
Dentistry	Phys. Dentists, Vets.	27 000	96
Medicine	Phys. Dents., Vets.	16 500	86
Nursing	Nurses, Therapists	14 500	81
Pharmacy	Pharmecists et al	17 900	91
Math., Physical Sciences	Mathematicians et al	16 200	28
Total College	Nurses, therapists	13 000	20
Fine., Appl., Perform. Arts	Artists, Designers	10 400	30
Bus., Manage., Commerce	Finance & Stats. Clerks	10 800	18
Secretar., Arts, Sciences	Stenographers	9 100	66
Data Proc., Comp. Sciences	Math., Stats., Comp. Sci.	14 500	64
Primary Industries	Farmers and Hort. Workers	12 400	31
Medical, Dental Services	Nurses, Therapists	13 000	70
Technologies	Technologists	13 500	26
Transportation	Air Transport. Workers	14 500	23
Mass Communication	Writers and Artists	10 600	25
Community Service	Social Service Workers	11 400	20
General Arts and Sciences	School Teachers[e]	8 500	20

Notes: a. Excludes Quebec which did not participate in the survey.

b. When the first and second most common occupations were separated by less than one percentage point, the two occupational groups were combined.

c. As a percentage of either total university or total college, as appropriate, for graduates who were employed full-time.

d. Elementary and secondary teachers plus vocational, community colleges, and specialized teachers.

e. Elementary and secondary teachers.

For the colleges, there are also strong links between training in secretarial, computing, and nursing skills and the occupations using these skills.

The labour market experience of the 1976 doctoral graduates was surveyed separately and was reported earlier.[31] There were 1693 Ph.D. degrees awarded by Canadian universities in 1976. Questionnaires went to 1308 of these; of the 906 who replied, 739 were living in Canada. Among this latter group, 4.6 percent were unemployed, but just over one-third of this was voluntary unemployment. The unemployment rate in conventional terms was therefore 2.8 percent. The employed were distributed as follows: university teaching (43%); post-doctoral fellows (9%); government (17%); industry and commerce (11%); health care (8%); other educational institutions (7%); and other positions, including self-employment (5%).

Relative earnings

Another set of data often used to evaluate labour market conditions is the relative earnings by occupation. For example, the current decline in relative starting salaries for university graduates is sometime cited as evidence that there is a "surplus" of graduates and that enrolments should be limited.

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31 Statistics Canada, 1976 University and College Graduates: Doctoral Degree Recipients, Cat. No. 81-571.

The average starting salaries offered to university graduates by 80 companies in Canada for the period 1965 to 1977 are shown in Figure 2. It is obvious that starting salaries declined sharply relative to average industrial earnings in the late 1960s and early 1970s. But the decline seems to have been very brief for engineering and science graduates since their relative salaries were more-or-less stable in the mid-1970s. More important, however, is the recent experience in comparison with the long-term trend. Unfortunately, historically comparable occupational earnings data are very limited. Two sources, however, offer a longer historical context in which to consider the current levels for relative earnings.

The trend in relative earnings for wage and salary earners in professional occupations in Canada for 1931 to 1961 was a substantial decline during the 1930s, and 1940s, followed by either stable or slightly improving relative earnings in the 1950s and a fairly strong improvement for some in the 1960s.[32] These patterns are seen in Figure 3. The relative total incomes of some self-employed professionals have followed approximately the same patterns. Doctors and dentists enjoyed a strong steady improvement in relative incomes in the 1950s and 1960s. Lawyers, engineers, architects, and accountants had a more cyclical and modest improvement in their relative positions.

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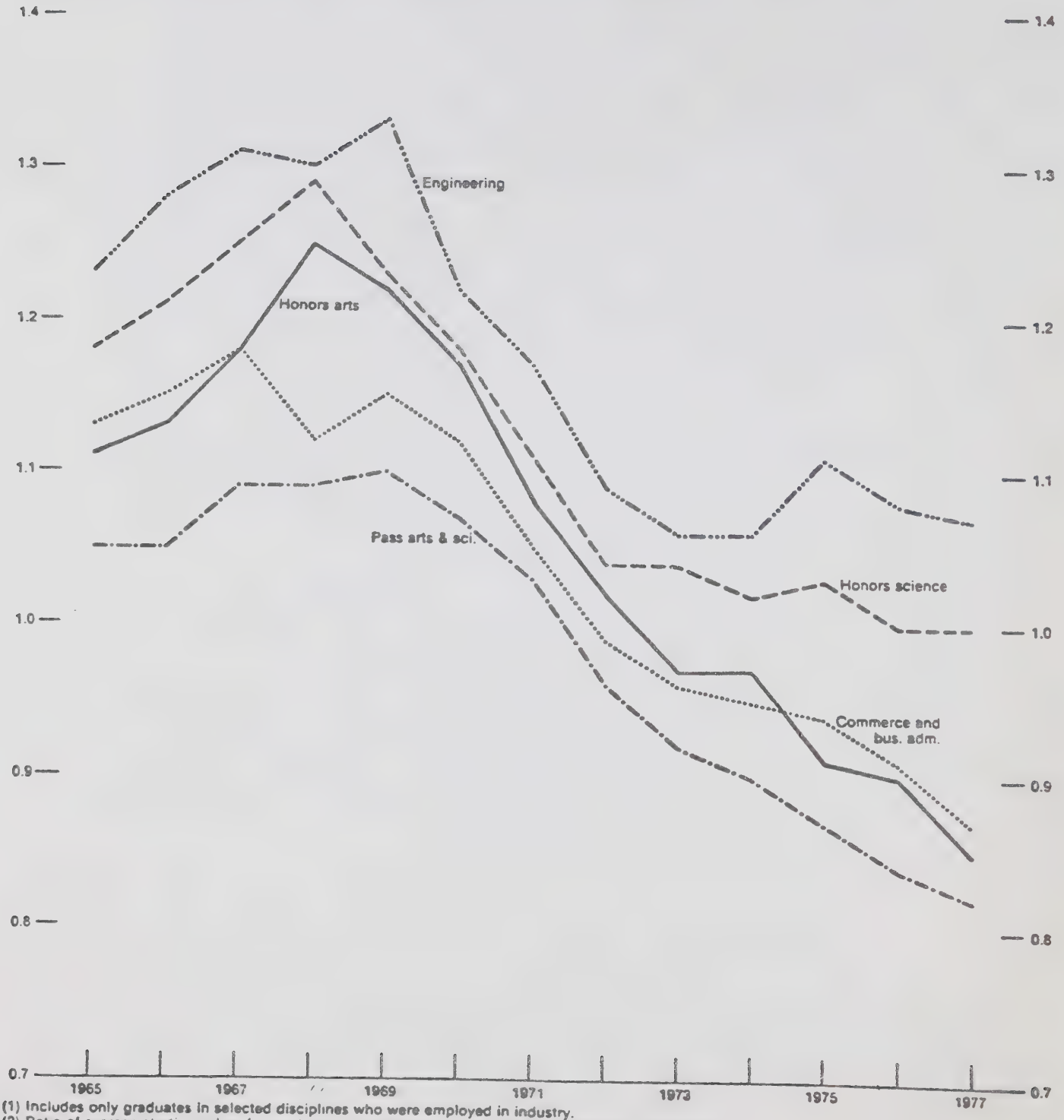
32 Noah M. Meltz and David Stager, The Occupational Structure of Earnings in Canada, 1931-1975, a report to the Anti-Inflation Board (Ottawa: Supply and Services Canada, 1979).

FIGURE 2

AVERAGE STARTING SALARIES OF BACHELOR'S DEGREE GRADUATES (1) COMPARED WITH AVERAGE INDUSTRIAL EARNINGS, CANADA, 1965-77

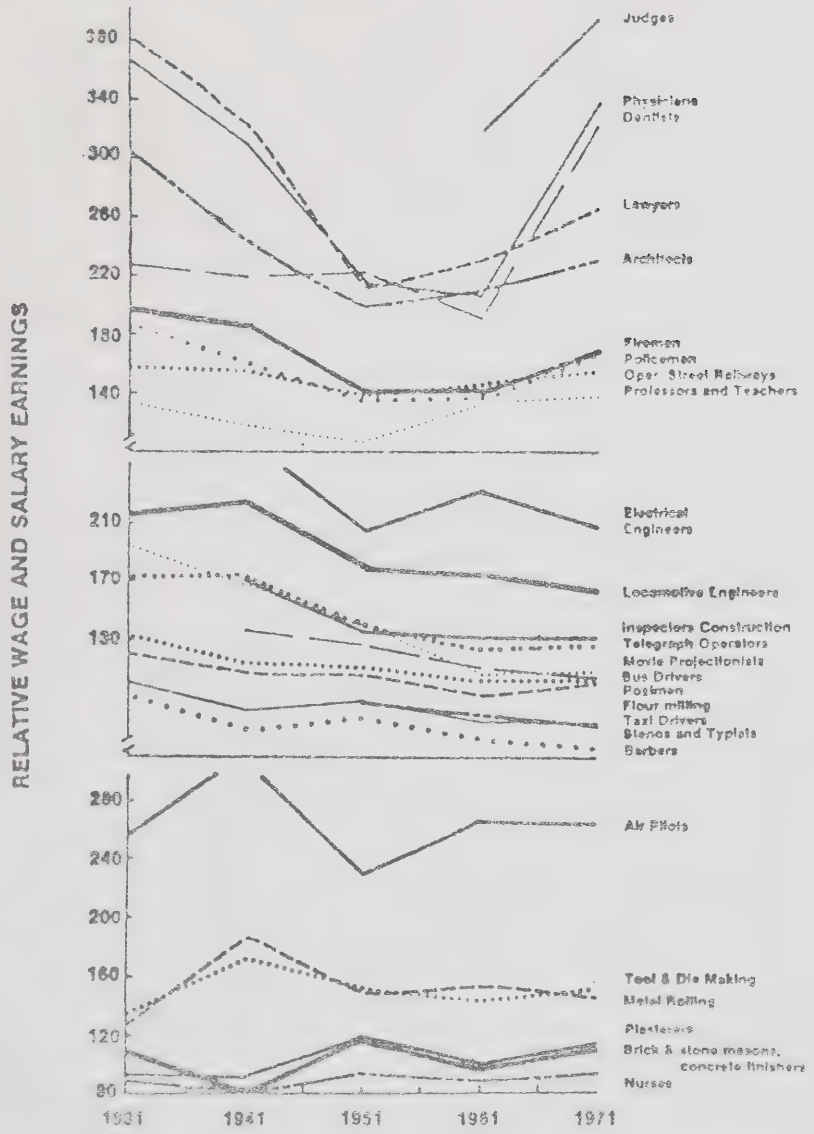


(1) Includes only graduates in selected disciplines who were employed in industry.
(2) Ratio of average starting salary for graduates to average earnings in industry (industrial composite)
Sources: Survey of Recruiting Rates for University and Community College Graduates, Pay Research Bureau, Public Service Staff Relations Board. And Employment, Earnings and Hours, Statistics Canada (72-002).

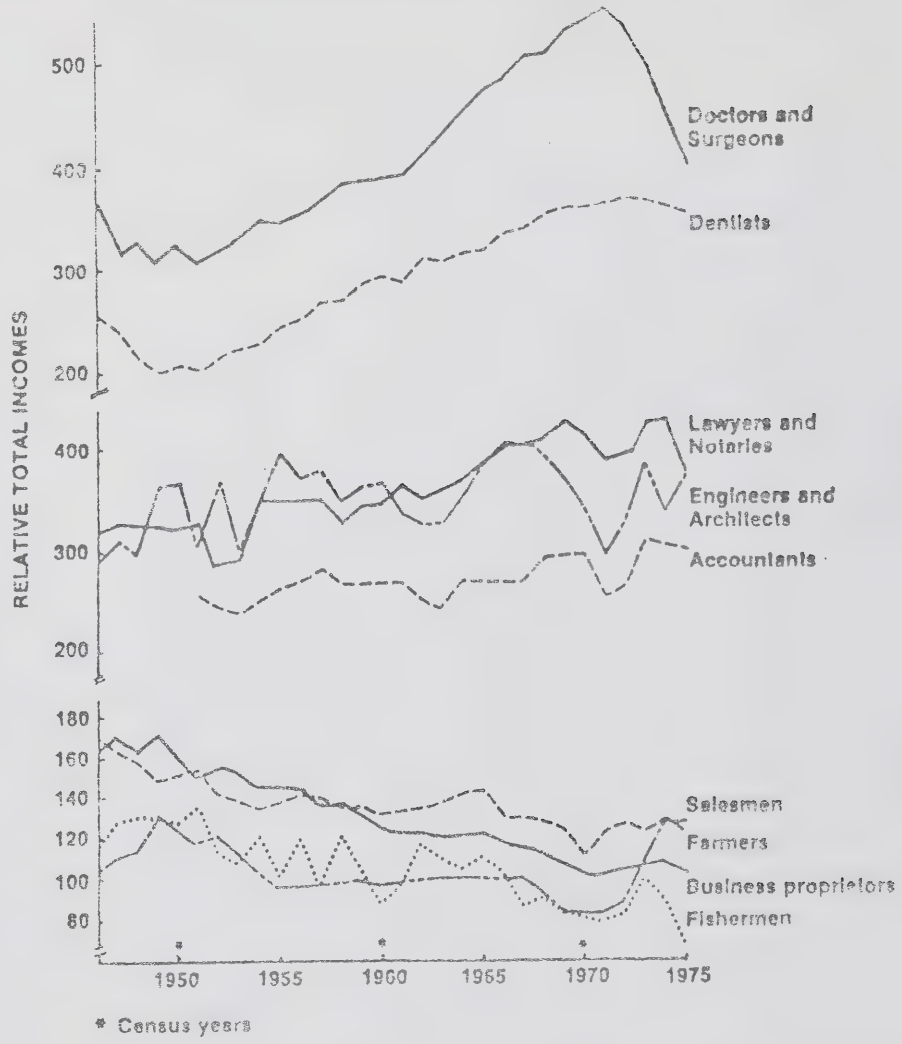
Source: Z. Zsigmond, et al., Out of School - Into the Labour Force, Chart 32.

FIGURE 3

Patterns of Change in Relative Wage and Salary Earnings in Selected Occupations 1931-71



Relative Total Incomes for Selected Occupations, Canada 1946-1975 (Self-employed persons)



Source: Noah M. Meltz and David Stager, The Occupational Structure of Earnings in Canada, 1931-1975, 1979

It would appear that the starting salaries of university graduates fit this more general context fairly well, and that the recent decline represents a return to relative salaries more typical of the 1950s and early 1960s.

CHAPTER 2

ALTERNATIVE PRIORITIES AND APPROACHES

AN AWKWARD SITUATION

The major conclusions of the preceding chapter were that the federal government in its responsibility for assuring strong and stable economic growth should have a more direct role in the development of highly qualified labour. Through its influence the federal government should encourage a reallocation of resources towards certain post-secondary programs.

This principle has been stated clearly by Peter Leslie, following a recent review of Canadian universities, in his proposed resolution that universitities should encourage the federal government:

> To meet Canadian needs for the training of highly qualified manpower, to the extent that these needs are not being met by provincial policies in relation to post-secondary education.[1]

He emphasized that this should occur with the understanding that:

> The role of the federal government must not be to substitute for provincial action but to supplement and support it; and it must be so seen by the provinces.[2]

The federal government has been left in a very awkward situation by the provinces in the past 15 years. The fundamental hurdle in designing a rational scheme for the development of HQL is the federal-provincial polarity on

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1 Peter M. Leslie, Canadian Universities, 1980 and Beyond (Ottawa: Association of Universities and Colleges of Canada, 1980), p.372.

2 Ibid, p.369.

matters relating to education and training.[3] Neither jurisdiction has been well-served in the past two decades by these political tensions and, consequently, Canadians have not been well-served. The provinces have tended to see research (especially pure or basic research) as a federal matter and the federal government has been persuaded to treat instruction as a provincial matter. Yet numerous reports in Canada and elsewhere have agreed that research and instruction at the university level are inseparable.[4]

One bizarre result of this dichotomy is that manual skills can be treated as "training" under federal jurisdiction in the Occupational Training for Adults Act, yet mental or intellectual skills are treated as education and hence must fall under provincial jurisdiction. Consequently, the federal government can exercise considerable influence on the number of welders trained each year, but has virtually no influence on the number of chemical engineers.

The dichotomy would not be so serious for the economy's well-being were it not that the provinces generally seem to have accorded higher priority to distributional or equity

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[3] There is little to be gained by citing yet again alternative views on the meaning of section 93 of the British North America Act. It seems quiet implausible that anyone in 1864-1867 gave any thought to whether students in an MBA degree program were a federal or provincial responsibility. More to the point is what now is acceptable to federal and provincial governments.

[4] See for example, John B. Macdonald, et al, The Role of the Federal Government in Support of Research in Canadian Universities (Ottawa: Queen's Printer, 1969), also Commission on the Relations Between Universities and Governments, The University, Society, and Government (Ottawa: University of Ottawa Press, 1970).

objectives in post-secondary education and a much lower priority to the allocation or growth objective. Furthermore, the provinces seem to have been persuaded by their universities to eschew manpower planning as a partial guide to educational planning.[5]

To the extent that provinces give higher priority to distribution or accessibility they are likely to exacerbate manpower imbalances. A simple measure or criterion of accessibility is the percentage of children from a given income class who are enrolled in post-secondary education. Since the financial and academic requirements are lower in applied arts and humanities programs, one would expect to see a disproportionately large expansion in these areas. This is what has happened in the past two decades, particularly with the shift from the allocational to the distributional emphasis in the 1960s.[6]

The fact that provincial grants to universities have not kept pace with other provincial expenditures is a recurring problem. In 1950, it was noted that:

> While the provinces have more than trebled their expenditures on highways and public works, on agriculture, and indeed on almost everything except the debt services, the appropriations to the universities have not increased proportionately...the grants made to

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5 The OECD Review of educational policy in Canada noted that "... little attempt is made to gear educational planning to the future manpower needs of the country..." OECD, Review of National Policies for Education, 1966, p.117.

6 See enrolment and degrees data by field of study at universities and community colleges, Part I, Chapter 1.

> universities by the provinces are only three times what they were thirty years ago whereas total provincial expenditures have increased six and half times.[7]

A very recent report on the future of Canadian universities has portrayed their aimlessness - resulting from the conflicting objectives of their financial sources - in the following way:

> Our survey of the arrangements which Canadian society makes for the financial support of its universities has revealed two major flaws. One is that there is hardly any carrot for innovation; the other is that there is only a very flimsy stick for inducing structural change where it is necessary, and for inventing solutions to staffing problems and program redundancy or overcapacity.[8]
>
> In short, there must be rewards for attracting students and penalties for driving them away; and this implies a financing technique which is fairly sensitive to enrolment, at least over the longer term. Only under these conditions can an institution have any financial incentive to take its teaching function seriously, to redesign academic programs and to revise curriculum to meet changing needs and to reflect changes in knowledge, and to reward its faculty for excellence in teaching.[9]

The federal government will find it increasingly difficult to be detached from the manpower planning aspects of post-secondary education as HQL becomes a dominant part of the Canadian labour force and applied research becomes an increasingly important factor in Canadian productivity growth

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7 N.A.M. MacKenzie and D.C. Rowat, "The Federal Government and Higher Education in Canada," Canadian Journal of Economics and Political Science 16(3) (August, 1950), p. 354.

8 Leslie, Canadian Universities, 1980 and Beyond, 1980 p. 314.

9 Ibid, p.315

and international competitiveness.[10] There will then need to be an accommodating agreement on the distinction between distributional and cultural objectives and growth objectives in post-secondary education.

Some Canadian universities (and a few community colleges or polytechnics) should not be allowed to become merely "provincial" institutions in the most disparaging sense. Some prominent U.S. universities were strongly established as "private" institutions before the emergence of twentieth century dependence on public support. Consequently, they are recognized as national institutions and supported as such. Similar arrangements should be made for Canada's national universities and polytechnical colleges.

The timing of government policy changes has accentuated the difficulties encountered by post-secondary institutions in the post-war period. The following comments by Freeman on the U.S. university experience apply equally to Canada:

> Federal policies exacerbated rather than ameliorated both cobweb and longer-run adjustment problems. Federal R&D spending, which increased greatly in the early and middle 1960s and fell relative to GNP thereafter, was a major contribution to the sixties boom and seventies bust. Fellowships and scholarships encouraged "overproduction" of master's and doctoral graduates in the 1960s and discouraged enrollment in the 1970s. The high variability of federal spending and the demand for high-level manpower, often responding to short-term crises, was the "squeaky wheel" in the market, inducing

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10 HQL now constitutes 20 to 35 percent of the labour force, depending on the definition selected. See Part I, Chapter 1.

cyclical ups and downs and the uneven production of graduates.[11]

This effect was at least as strong at the provincial level where grants were increased substantially in the early 1960s in response to increased demand for secondary and post-secondary teachers and for other HQL employees. The opposite reaction in the early 1970s was at least as large and as abrupt. In each case a more moderate shift in policy was required.

FEDERAL FINANCIAL SUPPORT

There is literally a long list of potential alternative methods for federal financial assistance to post-secondary education. These would include at least the following forms of financial assistance:

To provinces-

- unconditional grants or transfers
- relinquishing income tax points
- conditional, shared-cost grants
- grants for specific purposes

To intermediaries -

- national commissions
- federal-provincial commissions
- provincial commissions
- research councils

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11 R.B. Freeman, The Overeducated American, 1976, pp. 186-187.

To institutions -

- ° general or block grants
- ° specific grants - operating
  - capital
- ° tax-exemptions - for charitable donations
  - rebates
  - sales tax
- ° gifts - use of government property, equipment or staff
  - donation of surplus or used equipment, land or buildings

To individuals -

- ° grants - vouchers
  - fellowships, scholarships, bursaries
- ° grant/loan contribution
- ° loans - conventional
  - direct
  - guaranteed
  - variable term
  - contingent repayment
- ° tax deductions or credits

Established program financing and its alternatives

The current provision for federal contributions to post-secondary education must be seen simply as a relinquishing of income tax points with a transitional cash adjustment. But the federal government's 1977 policy for Established Programs Financing (EPF) has virtually no guiding

effect on the development of HQL in Canada because it has no influence on the structure of post-secondary education. The origins or antecedents of EPF were described in Part One under the current role of the federal government in post-secondary financing. The EPF policy assumed that increased provincial revenues through cash transfers and tax points would encourage the provinces to maintain their financial support for post-secondary educational systems. The provinces, however, have treated these transfers as general revenue since the transfers are "unconditional" and have reduced their expenditures for post-secondary education below the level that would have been realized under the former Fiscal Arrangements Act.

Large sums are involved. The cash transfers for the post-secondary education portion of EPF are estimated to total more than $1.6 billion for 1980-81. This is equal to about 27 percent of all post-secondary operating and capital expenditures in Canada. One must then ask whether this amount can be directed more effectively such that the Canadian post-secondary system can respond to national needs for HQL while respecting traditional university autonomy or freedom from political interference.

There are at least two possible approaches to a broadly based alternative federal policy. Each would resemble and draw on past federal experience.

One alternative would be a modified shared-cost program whereby the federal government's contribution was directed simply at "topping up" provincial expenditures. In this situation the federal government might provide one dollar for every three or four dollars of provincial expenditure instead

of the 50 or 75 percent contribution in earlier programs. This scheme has the advantage that it encourages provinces to spend in the federally desired areas, but the incentive is mild enough that a province can afford to reject the federal direction should it have strong reasons for doing so. While this scheme could encourage provinces to provide adequate general support to educational institutions, it does not direct funds to more specific manpower needs. Unconditional or general shared-cost grants have no steering effect on the degrees or programs offered by the universities and colleges. Consequently, perverse results may occur. For example, the current provincial stringency in general university support, with the universities' resources allocated internally on ill-defined grounds has resulted in enrolment quotas on commerce programs just at a time when this field should be increasing its rate of graduate output.

A different approach would be to provide funds for specific programs. Since it seems quite unlikely in the current political context that institutions could receive federal grants of significant mangitudes for a variety of programs, an intermediate agency would need to be formed. This could be a buffer organization which might combine features of the Canadian Universities Foundation, which received and dispersed federal funds in the 1950s and 1960s, and the provincial universities or post-secondary commissions which advise their governments on financing policies. Such a model would be similar to the University Grants Commission in Great Britain, and would parallel but not duplicate the work of existing granting councils in Canada.

Such an organization could have a well-defined mandate based on the development of HQL. In an ideal world it would consist of representatives from both levels of government, and would receive funds from both levels to be allocated to institutions and programs as needs were determined by a well-developed research program. This would be a Canadian Commission on Professional and Technical Manpower. The resemblance to national and provincial manpower commissions in Canada and elsewhere will be obvious to readers familiar with manpower research and programs. But the important difference here is that such a commission would be empowered to receive and disperse funds. The organization just described would be intended to exercise the carrot and the stick which Leslie (among others) notes is lacking in existing programs.

A somewhat similar organization was proposed by the Commission on Educational Leave and Productivity, but their National Education and Training Agency would be more concerned with lower- and medium-skill levels and would work more directly with employers and trade unions.[12]

The proposals in the following sections are based on two assumptions: first, that the federal government chooses to provide substantial support for the financing of post-secondary education by means other than conditional grants to the provinces, and second, that it wishes to

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12 Ibid., pp. 235-236.

exercise some influence over the composition of highly qualified labour through its financing mechanisms.

Student loans

The Federal-Provincial Task Force on Student Assistance has just made public its report in which it reviews the adequacy of existing student aid programs and identifies the advantages and disadvantages of alternative schemes.[13] This section can therefore be less comprehensive than it otherwise would need to be. Emphasis can also be given to allocative considerations since the Task Force has focussed mainly on the distributive effects of contemporary student aid.

Canada Student Loan Plan

The existing Canada Student Loan Plan (CSLP) has several commendable features: it covers a large fraction of the post-secondary population; the amounts are large enough to meet a substantial portion of a student's expenses; the loans are administratively easy to arrange; they can be combined in one package with a provincial bursary; and they are fully portable interprovincially and internationally. The disadvantages, however, need more serious attention. The loans are available only to students meeting the income test; the default rate is higher than for conventional loans partly because they are government guaranteed; the repayment period is relatively short when compared with the lifetime nature of the human capital they are financing; some students are

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13 Federal-Provincial Task Force on Student Assistance, Report, (Ottawa: Supply and Services Canada, 1981).

deterred from a post-secondary education by the prospects of a large debt; and these loans are neutral with respect to students' study or career choices.

Should there be no major changes in the type of loan plan provided for students, the CSLP should be made available to those students who do not qualify under the means test but with interest charged from the beginning of the loan and at the same rate.

Variable term loans

A variation on the conventional loan scheme is the variable term loan. The full principal and accumulated interest must be repaid, but over a term which can be varied to accommodate individual circumstances or government policies.

Contingent repayment loans

An alternative loan program that has been proposed for several years for post-secondary education is the contingent repayment loan.[14] This was intended to make it possible for all students to borrow, to mutualize the possibility of high-risk levels for some individuals, and to lengthen repayment periods to reduce annual amortization costs. Under this plan a government agency would make loans to students for their direct costs of education. After graduation, the borrower would pay some fraction of his/her annual earnings

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14 The original proposal appears to have come from Milton Friedman in his essay, "The Role of Government in Education," in R.A. Solo ed., Economics and the Public Interest (New Brunswick, N.J.: Rutgers Press, 1955) pp. 135-43.

until the loan was repaid or the outstanding balance forgiven. The major dimensions of the loan program could be varied to make the program self-financing or to introduce whatever degree of subsidy was preferred.

The major variables in the contingent repayment plan are: 1. the ceiling on amount borrowed (and eligibility conditions); 2. the percentage of annual income to be paid against outstanding principal; 3. the interest rate; 4. the length of repayment period; 5. conditions by which the outstanding balance can be repaid or emigration can be accommodated; 6. arrangements for persons who are not in paid employment after graduation. One simulation analysis of such a scheme applied to the Canadian context (using data for the late 1960s) found that the break-even conditions when the government borrowing rate was 10 percent would be a tax rate of 10 percent, interest rate of 12 percent, a repayment period of 30 years, and an annual income of $2000 imputed to persons without employment income.[15]

Further variables can be introduced in a plan of this kind to encourage students and graduates to be more responsive to manpower requirements - as determined by the government. Loan conditions can be made more favourable for students entering specified fields of study. More direct influence can be had by favouring persons who enter certain

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15 Gail C.A. Cook and David Stager, "Student Aid: A Proposal and Its Implications," Canadian Tax Journal XIX (6): 558-564.

occupations and/or industries through reducing their annual repayments by an amount and/or number of years. In this way, more "fine-tuning" is possible than under conventional loan and scholarship plans. It is also a method for providing what, in effect, are wage subsidies without the additional administrative machinery required to make subsidy payments to employers.

Contingent repayment schemes can also be viewed as an arrangement whereby a given generation or cohort of the population finances its own post-secondary education rather than relying on the political willingness or taxability of the preceding generation - or rather than having to be taxed to finance the following generation. This aspect is of considerable importance where there are major demographic changes such as the post-war "baby boom."

The Student Assistance Task Force has unfortunatley treated contingent repayment plans rather briefly and seems to have misinterprented some features of these plans. The income-contingent aspect is not intended to be directly related to the economic benefits of one's further education, but simply to take account of the risk and uncertainty of future ability to repay from the perspective of a potential post-secondary student. When the contingent repayment feature is carefully explained there should be no income-class bias in the utilization of the scheme.

The Task Force suggests that using the income tax system for collection purposes would be "a practical disadvantage"

but surely the opposite is true. This system would reduce the default rate and the administration costs and would simplify arrangements for alternative payments, just as these are now made for deferred tax payments.

Whenever the contingent repayment system has been proposed, it is understood that it would need to be introduced gradually and would likely be used in conjunction with other financing mechanisms. For example, there will be specific objectives or programs warranting bursaries.

The most recent prominent proposal for a contingent repayment loan plan comes from the Carnegie Council on Policy Studies in Higher Education which has recommended that the U.S. government establish a National Student Loan Bank to administer such a scheme.[16] Loans would be repaid by a tax of .75 percent of income for each $1000 borrowed; unpaid balances would be forgiven after 30 years; collections would be made through the income tax system; there would be no means test; and the scheme would be self-financing.

Fellowships, scholarships, and bursaries

The federal government should introduce its own bursary program for post-secondary education. This would be complementary to the loans program, and thus similar to provincial bursary programs, but it would enable the federal government to equalize student financial assistance across

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16 Carnegie Council on Policy Studies in Higher Education, The Federal Role in Postsecondary Education (San Francisco: Jossey-Bass, 1975).

the provinces. More importantly, the bursary program could be used to establish wider differences in the relative prices (i.e., tuition fees and other costs) of different programs and institutions. Although there is considerable evidence of an inelastic demand for aggregate post-secondary enrolment with respect to tuition fee changes,[17] there is some indication - as one would expect - that students are more responsive to differences among tuition fees for different fields of study.[18] Since universities and provincial governments appear loathe to have significant differences among tuition fees for different fields of study, price rationing or discrimination for various fields and institutions could be achieved indirectly by differential bursaries.

Freeman suggests that the allocative intent of this arrangement be made obvious by terming it a "labour market stipend program." Such stipends would be awarded on the basis of expected labour market imbalances, as determined by a committee of manpower specialists.[19]

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17 M. Handa and M. Skolnick, "Empirical Analysis of the Demand for Education in Canada," in S. Ostry ed., Canadian Higher Education In the Seventies (Ottawa: Economic Council of Canada, 1972).

18 L.R. Maglen, "Student Assistance Schemes and the Supply of Highly Skilled Manpower: The Australian Experience," Economic Record (April, 1978): 94-110.

19 R.B. Freeman, The Market for College-Trained Manpower (Cambridge, Mass.: Harvard University Press, 1971) pp. 114-115.

Student financial assistance from federal sources has the additional advantage that it can be used to encourage interprovincial mobility of students and hence foster more uniform utilization of institutional capacity, permanent interprovincial migration of HQL for more efficient allocation, and enhanced national understanding and unity.

Similarly, federal bursaries can be used to offset tendencies for some provinces to underinvest in post-secondary education. This is likely to occur in provinces that have a net emigration of post-secondary graduates due to lack of employment opportunities at comparable wages in the province concerned.

The opposite occurs when provinces have a net immigration of students (who do not necessarily remain in the provinces). There often have been proposals to set a higher tuition fee for out-of-province Canadian students. In his AUCC study Leslie recognized this problem and proposed a federal-provincial transfer to compensate such provinces:

> That the Government of Canada institute a program of financial compensation to the governments of those provinces which have a net influx of university students, and that the funds transferred be fixed at a level equal to the provincial per-student grant to the universities, times the number by which non-resident students exceed the number of provincial residents studying at universities elsewhere in Canada.[20]

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20 Peter M. Leslie, Canadian Universities, 1980 and Beyond (1980, p. 400 (recommendation 9.)

The same objective could be accomplished, however, through accomodating any non-resident tuition fee differential in a federal bursary. This avoids the administrative cost of a separate federal-provincial transfer and the negotiation of an appropriate differential.

One reason for the low rate of return to graduate study is the high cost of forgone earnings. Since these are directly related to the length of time in graduate study, incentives should be incorporated in graduate fellowships and loans to encourage doctoral students to reduce the time taken to complete their theses. NSERC now provides fellowships for up to four years of a doctoral program and has been urged to increase this support period. Instead, graduate fellowships should include a "job search" bonus if the Ph.D. degree is obtained in less than say 80 percent of the time normally required.

Graduate fellowships are needed particularly for the field of business administration. Despite high private rates of return for graduates of MBA programs, there continues to be an inadequate number of persons with advanced training in management skills.[21] Such fellowships should include a requirement that recipients would repay at least a major portion of the grant if they are not employed in Canada.

Research support

This report is concerned with instruction as it relates to the development of HQL; it is only very indirectly concerned with research personnel and activities. But most

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21 Max von zur Muehlen ed. Managing in the 1980s: the Crisis in Management Education and Research (Ottawa: Statistics Canada, 1979).

studies in the financing of post-secondary institutions have recognized that research and instruction are closely associated. While it may be possible to separate these activities for some individuals, it is not feasible in some fields, especially in the physical or life sciences. In medicine, engineering, and other applied sciences, for example, it is necessary to maintain a university research capacity in order to provide the teaching staff in these fields.

There are two specific components of research resources for which the federal government should provide substantial financial support. These are in the maintenance and development of research equipment and libraries. Both these areas are in danger of deterioration under the current financial contraints on universites but both are used in teaching as well as in research. This has been recognized to a certain extent by the federal granting agencies (NSERC, MRC, SSHRC), particularly in support of equipment.

In the case of libraries, the federal government should offer additional tax incentives (such as a 75 percent tax credit) to the private sector to encourage corporate contributions for library development. Since research libraries are generally open to the public, and since professional employees in the private sector could be expected to make increasing use of the library resources in their work, employers should be encouraged to see the benefits of joint private-public development of research libraries. The federal government should also endow professorial chairs in research areas relating to specific

federal interests.[22] These could include a wide range of subjects such as international affairs, native peoples, environmental issues, and agriculture and fisheries.

Educational leave

Paid educational leave for employees has been examined seriously in the Canadian context.[23] Under such a plan there would be "leave granted to a worker for educational purposes for a specified period during working hours, with adequate financial entitlements."[24]

Although these arrangements are proposed primarily for semi-skilled workers to augment or maintain industrial skills, such a plan is of at least as much importance to HQL. Professional workers generally require longer periods to undertake major study programs and consequently the employee or the employer would incur exceptionally large costs in terms of forgone earnings or forgone output. Substantial government participation would likely be required for such a program.

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22 This proposal also appears in John Porter, Bernard Blishen, et al, Towards 2000. p. 133.

23 Education and Working Canadians, Report of the Commission of Inquiry on Educational Leave and Productivity (Ottawa: Labour Canada, 1979).

24 Ibid, p.3.

The federal government could take a direct and strong lead in implementing such a program through use of tax incentives. The income of an employee on educational leave could be completely exempt from personal income tax which would greatly reduce the contribution required from employers or employees to finance the program. In this way, the federal government could closely regulate the occupations, length of time, and other conditions that would determine eligibility for the program.

An alternative arrangement would be a registered educational leave plan similar to the registered plans for retirement savings (RRSP) and for home ownership (RHOSP). A recent federal government commission suggested that such a plan:

> ...would be very useful, however, to professional and highly-skilled people. It would provide them with an incentive to set aside the funds needed to finance periods of leave during which they could renew and update their general qualifications or prepare for more advanced positions.[25]

The commission recommended that all employees be permitted to depsit $2500 each year into a Registered Educational Leave Plan. These deposits would be treated in the same way that other registered savings plans are treated for tax purposes. Deposits would not be taxable provided that the fund when withdrawn was used for education or training purposes and that the individual received no employment income during the educational leave. There are obvious difficulties that would arise in administering such a plan, but the advantages

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25 Ibid, p. 233.

associated with well-intentioned individuals using their savings in the manner proposed should be emphasized. Moreover, the employment effects of other persons being absorbed to replace the persons on leave is also important.

The leave period is important not only for further learning but also to encourage and enable employees to review their career development. If this results in a change of employer, occupation, or industry, it could be assumed that this would usually result in a more efficient allocation of labour.

More radical variations of educational leave have been proposed on the basis of models which also resemble the contingent repayment schemes described in the student loans section. One such variation is the Human Investment Fund proposed by Stephen Dresch.[26] This would provide an endowment of $10,000 for every individual at age 18, and adjusted annually for inflation. One could draw on the fund for "broadly defined human capital forming purposes," but a tax of a given percentage of total income would be imposed for 30 years beginning at age 18. The individual would also earn interest on the unexpended portion of the fund. Such a scheme opens far more options for individuals than either the contingent repayment loans or the voucher schemes which would each be limited by criteria concerning eligible individuals and institutions.

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26 Stephen P. Dresch, "U.S. Public Policy and the Evolutionary Adaptability of Postsecondary Education," in Selma J. Mushkin ed. Recurrent Education (Washington: National Institute of Education, 1973).

A less radical proposal suggests that contingent repayment loans be made available for educational leave or "recurring education."27

PROVISION OF INFORMATION FOR POLICY DEVELOPMENT AND CAREER CHOICE

One of the most serious impediments to the satisfactory development of HQL is lack of information for policy evaluation and development and for individuals' career planning. This general problem can be treated under the following categories:

1. data collection and analysis
2. information dissemination
3. opportunities for students to gain labour market experience.

Data collection and analysis

One of the familiar paradoxes in government policy is that just when better labour market information is required, the budget for producing this information is reduced. The starting point for labour market information is collection of data through surveys of employers, institutions, and individuals. Statistics Canada has developed several surveys which have either been reduced or eliminated. These should be restored and augmented. Some of the most significant surveys for HQL purposes would include the population census, and surveys of the labour force, job vacancies, occupational employment, post-secondary students, and graduates.

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27 K.R. Biederman and B.B. Billings, Income Contingent Loans for Recurring Education, in Selma Mushkin ed. Recurrent Education.

The federal government should give higher priority to forecasting the supply of and demand for HQL at alternative salary levels. Forecasting at this skill level is especially important because the long gestation (or training) periods can result in stronger cyclical movements than for other occupational groups. There is also a more significant economic effect on other employment since market imbalances or major shifts in relative earnings for the HQL group will have substitutability and complementarity effects on other occupations. It is through the government's concern for economic stability that it should be attempting to identify and moderate long-term destablizing elements in the HQL market.

Dissemination of labour market information

> To facilitate the student's choice of entering a post-secondary education programme or entry into the labour market, government should develop procedures designed to provide better information to students concerning career possibilities, earnings expectations and areas of excess supply or demand for graduates. This information would be of great assistance as support material for the high school guidance counsellor.[28]

The comment quoted above is an example of the increasing awareness that students and their advisors require much more information to make educational and occupational decisions. Such information should be distributed not only to guidance

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28 Ontario Economic Council, Issues and Alternatives 1976: Education, (Emphasis added).

counsellors but also to the popular media which reach a large proportion of high school students and to newspaper writers who address the student's parents.

Several studies have found that high school and post-secondary students derive relatively little career information from formal guidance sources:

> The small importance attached to formal sources in information [guidance teacher, commercial testing and government agencies] together with the overall inadequacy of the information received suggests that the formal providers of information must improve greatly their penetration if students are to have better information.[29]

Career choices are not so much a decision as they are the outcome of a process. Moreover, it is a process that begins in early childhood and is largely completed by adolesence. Although some middle-aged professional persons may argue that they were quite undecided or confused about their occupational choice at age 16, 20 or 24, there likely was little doubt about continuing to post-secondary education rather than entering an apprentised trade because that basic choice is usually made at earlier ages.

The Carnegie Commission in its review of post-secondary education in the United States found that inadequate career information was one of the major problems to be solved. One

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29 D.A. Dodge and N.M. Swan, "Factors Influencing Career Choices of Students," (1971), p. B-7.

of its recommendations was that federal government agencies should take steps to improve the flow of current occupational information and to make it available more promptly.

The Commission further explained that:

> Despite the fact that this need has long been recognized by manpower experts, and has been the subject of recommendations by a number of advisory committees to the federal government, not much progress has been made.
>
> If we are to rely in large part on the sensitivity of student choices of fields to occupational shifts, we need to provide students with the best possible information.[30]

The information which ought to be emphasized in career publications would include the following:

1. Explanations of cobweb effects in labour markets, with lagged supply responses to changes in relative salaries resulting in strong cyclical changes in employment opportunities.

2. Discussions of typical long-term career paths, emphasizing, for example, the change in job functions as engineers move into managerial positions and thus the need for wider occupational perspectives and preparation in career planning.

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30 Carnegie Commission on Higher Education, College Graduates and Jobs (New York: McGraw-Hill, 1973), p.187.

3. Descriptions of nonmonetary advantages or benefits which should be considered when comparing published earnings of various occupations.

4. Explanation of the "internal labour market" concept, focusing on the need to identify "ports of entry" to major employers or professions, and the process for mobility within the market.

5. Discussions of opportunities and procedures for changing occupations and the costs and benefits for doing so at various stages.

Labour market experience as information

In a survey of occupations experiencing chronic shortages, it was found that "previous work experience proved important in the occupational choice of large numbers of the practitioners in the six occupations."[31]

Cooperative education, work-study and summer placement

Various methods for assisting students to find employment during the course of their study programs is included under the information section of this report rather than with financial assistance because these schemes are viewed primarily as means for providing intensive, high-quality labour market information. The methods considered here are cooperative education, work-study, and summer placement. A few words to distinguish these programs may serve as a useful introduction.

Cooperative education is the combination of equal periods of formal study and employment in a job closely related to the field of study. A student would spend one term or semester at university and then spend the next term in employment, for all or part of the degree program. work-study would be better understood as "work-and-study"

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31 Walter Franke and Irvin Sobel, The Shortage of Skilled and Technical Workers, (Lexington, Mass.: Heath, 1970), p.301.

with a student holding a part-time job concurrently with his study program. The summer placement program simply entails a student spending the summer period in employment related to his field of study. In each case more administrative effort and co-operative attention by employers, governments, and educational institutions is required than when students seek their own employment opportunities. Each of these programs is common in the United States, often operating with government subsidy and administrative support, but there are relatively fewer examples in Canada.

Freeman is quiet direct and emphatic on the effectiveness of summer employment for information. He argues that:

> The evidence that a sizable minority of students, particularly social science and humanities majors, needs additional information about careers and that the chief source of information is employment suggests the establishment of government or industry summer job programs. By offering jobs in "shortage" areas, a job program could alleviate shortages, create interest in these occupations, and improve the information network. Since students are mobile, a national computerized placement program is a reasonable possibility.[32]

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32 R.B. Freeman, The Market for College-Trained Manpower (Cambridge Mass.: Harvard University Press, 1971), p.228.